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IMPERIAL BUREAU OF ANIMAL HEALTH

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VETERINARY BULLETIN

Vol. 14.] **February, 1944.** [No. 2.

DISEASES CAUSED BY BACTERIA AND FUNGI

TOBLER, A. B., & PINNER, M. (1943). **The Effect of Pleural Effusions on the Growth of Staphylococcus aureus in vitro.**—*J. Bact.* **45.** 341–348. **285**

In 1932, PINNER & VOLDRICH showed that tuberculous effusions contained a factor serologically related to staphylococcus agglutinin. In this present work, 49 tuberculous effusions were tested as culture media for *Staph. aureus*, with controls in nutrient broth. In each instance the resultant growth was poorer in effusion than in the control broth. The actual degree of inhibition of growth by effusion was not related to the agglutinin titre for *Staph. aureus* nor to any deficiency in nutritive qualities.—D. L. ROBARTS.

HADLEY, P., & WETZEL, V. (1943). **Conditions Contributing to Streptococcal Virulence. I. Intra-phasic Contrasted with Inter-phasic Variation.**—*J. Bact.* **45.** 529–544. **286**

An α-haemolytic streptococcus isolated from the blood serum of a patient with subacute bacterial endocarditis appeared on primary culture in the smooth phase. After subculture a perfected rough phase culture was obtained of which the M.L.D. for mice was 0·7 ml. After 38 serial passages in mice, the virulence was increased to an M.L.D. of 0·000001 ml. During the first 11 passages, the organisms transformed from the R phase through RS and SR intermediate forms to the S phase, the virulence increasing from 0·7 ml. to 0·005 ml.—approximately the virulence of the originally isolated S strain. From the 12th to the 38th passage the organisms remained in the S phase, but the virulence increased from an M.L.D. of 0·005 to 0·000001 ml. Hence, the greater part of the total increase in virulence did not occur during the transformation from R to S (interphasic variation), but after the S state had been reached. The interphasic increase in virulence is seen to be 140 times, and the intraphasic 5,000 times.—D. L. ROBARTS.

HANSEN, P. L. (1943). **On Differentiation between Animal and Human Forms of the Trehalose-positive, Sorbitol-negative Group C Streptococci (" Human C " Streptococci).**—*Skand. VetTidskr.* **33.** 257–280. [In English]. **287**

The first part of the paper gives a review of the literature concerning Lancefield group C subgroups, with especial reference to the " human C " streptococci, with the available references to the finding of this subgroup in animals. Using the fibrinolysis test of TILLETT & GARNER, H. found it possible to differentiate between " human C " strains of human and animal origin. This is the first report of the fibrinolysis test covering " human C " streptococci of animal origin and 29 strains proved incapable of dissolving human fibrin. Four strains of human origin were distinctly fibrinolytic.—D. L. ROBARTS.

HUCKER, G. J. (1942). **Relation of the Number of Leucocytes in Milk to Streptococcus Infections of the Bovine Udder.**—*J. Milk Technol.* **5.** 323–333. **288**

Of 30,331 fore-milk samples taken from individual quarters of 8,000 cows, 68% contained less than 100,000 leucocytes per ml., 20% more than 500,000, and 10% more than 1,000,000 per ml.

Streptococci were very sparse in samples containing less than 100,000 leucocytes per ml. and increased directly with the leucocyte count. The authors consider that 500,000 leucocytes per ml. indicates udder infection, but that if it were proposed to eliminate animals on the leucocyte count alone, this standard would be too severe. When this test is used for diagnosis, only those with a count of 1,000,000 per ml. should be condemned.

A separate experiment was carried out with 104 cows over 2–4 lactations in which weekly fore-milk samples were examined. 98% of the animals whose milk had more than 500,000 leucocytes per ml. discharged streptococci at some time during the lactation period.

When samples taken from machine-milked cows were compared with comparable samples from hand-milked cows, a higher percentage of the former than of the latter had a high leucocyte count and high streptococcal counts.—N. S. BARRON.

EVANS, A. C. (1943). **Cross Protection between Heterologous Agglutinogenic Types of Beta Hemolytic Streptococci of Group A. II. An Immunogenic Group of Four Types.**—*J. Immunol.* **46.** 399–409. [For previous article, see *V. B.* **12.** 522]. **289**

Two antisera prepared with strains of Griffith's types 6 and 23 were found to protect mice against infection with strains of many types. An immunogenic group was established which included strains of types 6 and 18 and one tested strain each of types 15 and 19.

—E. COTCHIN.

SMILEY, K. L., NIVEN, C. F., Jr., & SHERMAN, J. M. (1943). **The Nutrition of *Streptococcus salivarius*.**—*J. Bact.* **45.** 445–454. **290**

A synthetic medium is described which supports the growth of *Str. salivarius* and of a few closely allied *viridans* streptococci, but not of any other species of streptococci tested.

The simplest effective medium contained, in addition to inorganic salts, glucose and sodium thioglycollate, seven amino acids (glutamic acid, leucine, arginine, iso-leucine, lysine, methionine, tyrosine) and riboflavin, nicotinic acid, pantothenic acid, biotin, thiamine and uracil.

It was also found that when glucose and phosphate were heated together and then added to the remaining sterilized fractions good growth always resulted.

—D. L. ROBARTS.

DE MENDONÇA MACHADO, A., & ALVES DE OLIVEIRA, J. J. (1942). O diagnóstico das mamites bovinas pelas provas colorimétricas e exames culturais dos leites. **[Colour and Culture Tests for Bovine Mastitis].**—*Repos. Lab. Pat. vet., Lisboa.* **5.** 59–71. **291**

The streptococci isolated from 640 specimens of milk from 496 cattle were typed. Of these animals, 126 showed abnormalities of the udder and 274 did not; there was no information about the remaining 96. The organisms were grouped as follows :– group I, showing a large zone of haemolysis, 8; group II, showing a narrow zone of partial haemolysis, 140; group III, showing a green zone, 308; group IV, showing no zone, 152; group V, showing a very tiny zone of partial lysis, 32. When tested with bromothymol blue, 305 of the specimens gave a positive reaction, and 160 were doubtful.—J. G. CARR.

UBERTINI, B. (1939). Un focolaio di infezione carbonchiosa ad insorgenza spontanea nelle anitre (Chairina Moschata). **[Spontaneous Anthrax in Geese].**—*Clin. vet., Milano.* **62.** 70–75. **292**

All of five Barbary geese, which had had access to blood from the carcass of a bovine animal dead of anthrax, contracted a fatal infection. The only external symptom was a swelling of the throat. P.M. changes included pericarditis, tarry unclotted blood, swollen spleen, and congestion of the intestine, kidneys and liver. Diagnosis was established bacteriologically.—J. E.

RITCHIE, J. N. (1942). **Tuberculin as a Diagnostic Agent for Bovine Tuberculosis.**—*Vet. Rec.* **54.** 395–397. Discussion pp. 397–398. **293**

R. reviews the past history of tuberculin testing with particular reference to the subcutaneous, double intradermal, and single intradermal tests. The reasons leading to the introduction of the comparative test based on the specificity of mammalian and avian tuberculins for cattle are discussed. It is suggested that many of the doubtful reactors which were encountered when the double intradermal test was used, a mammalian tuberculin only being employed, were attributable to more than one cause, but that the most frequent factor was a heterologous sensitization arising from infection with various organisms of the acid-fast group. Evidence is given of the existence of avian infection of cattle in which the organism was found P.M.

The methods of applying the tuberculin test to the Attested herds are summarized. The paramount importance is stressed of classifying as positive or doubtful reactors any animals showing the slightest departure from the normal negative. The comparative test should always be applied before such reactors can be classed as free from bovine type infection. The need for especial care in recording measurements and in assessing oedema or diffuseness with accuracy is noted. The correct siting of the neck injections in order to secure equally sensitive areas of the skin is important when comparative tests are being applied.

Figures are given indicating the percentage of reactors removed from Attested herds (1938, last three-quarters, 0·63; 1939, 0·52; 1940, 1·21; 1941, 0·42, and 1942, first quarter, 0·16).

The article and discussion which follows should be consulted in the original by those interested.

—R. E. GLOVER.

WORTHMAN, R. P. (1943). **Generalized Tuberculosis in a Dog.**—*Vet. Med.* **38.** 234–235. **294**

A case report.—E. G. WHITE.

URBAIN, A. (1942). Infection tuberculeuse spontanée chez deux rongeurs sauvages en captivité : porc-épic (*Hystric cristata* L.) et agouti (*Dasyprocta aguti* L.) **[Spontaneous TB. in Wild Rodents in Captivity—A Porcupine and An Agouti].**—*Bull. Soc. Path. exot.* **35.** 198–199. **295**

Some details are given of the histories and lesions. Human type tubercle bacilli were isolated from the lesions, and it is suggested that infection occurred *via* contaminated foodstuffs fed to the animals by the public.

FERREIRA, A. J. (1942). Comportement " in vivo " des formes de variation spontanée du *Mycobacterium tuberculosis avium*. [*In vivo* **Behaviour of Dissociated Variants of Avian Type Tubercle Bacilli].**—*Arq. Inst. bact. Cam. Pest.* **8.** 133–144. [In French : English and German summaries]. **296**

Rough strains of avian type *Mycobact. tuberculosis* were, in general, feebly pathogenic for rabbits and highly pathogenic for chicks. R variants tended to revert to the S form in the body of the chick, but remained R after passage through the rabbit.—ISOBEL W. BURTON.

FELDMAN, W. H., DAVIES, R., MOSES, H. E., & ANDBERG, W. (1943). **An Unusual Mycobacterium Isolated from Sputum of a Man Suffering from Pulmonary Disease of Long Duration.**—*Amer. Rev. Tuberc.* **48.** 82–93. [Spanish summary]. **297**

An acid-fast bacillus was isolated in culture from a human case of advanced bilateral pulmonary silico-tuberculosis extending over a period of six years. The organisms showed no obvious correspondence with human, bovine, or avian types of *Mycobacterium tuberculosis*, since it was non-pathogenic for the g. pig and only produced slight lesions in the rabbit and the fowl. It is suggested that originally it may have been a bacillus normally nonpathogenic for man, which was able to establish itself in the lungs owing to the existence of silicosis.—R. E. GLOVER.

TROCH, P. (1942). Übermikroskopische Beobachtungen an Tuberkelbacillen nach Einwirkung von Peteosthor. **[Ultramicroscopic Observations on Tubercle Bacilli after the Action of Peteosthor].**—*Z. Hyg. InfektKr.* **124.** 513–518. **298**

Peteosthor is made by adding 1 ml. of a solution of thorium X (containing 500 electro-static units of thorium) to 3 ml. of a colloidal solution of 0·05 g. platinum stabilized with 0·2 g. eosin immediately before use. This causes a much greater destruction of avian type tubercle bacilli in suspension than the thorium alone, and the destruction proceeds further than that caused by X-rays. The destruction was followed by electron microscope photographs, and was complete in about 48 hours.—J. G. CARR.

—. (1943). **Two More Cases of Glanders Develop on Franklin County Farm.**—*Iowa Vet.* **14.** No. 4. 17 & 21. **299**

A note suggesting that, because two horses which had reacted negatively to the mallein test, carried out on all the horses of a farm, gave positive reactions to a second test made five years later, infection had probably remained in crevices in the walls of the stalls. [The survival of infection in the two horses during this period does not appear to have been given consideration.]

—W. A. P.

SCHMIDT, E. (1942). Fünfzehn Jahre staatliche Entschädigung von Rotlaufimpfverlusten in Mecklenburg. Ergebnisse und Folgerungen. **[Fifteen Years of State Compensation for Swine Erysipelas Immunization Losses in Mecklenburg. Results and Conclusions].**—*Tierärztl. Rdsch.* **48.** 295–298. **300**

Compensation was paid for all pigs, inoculated before July 15th in each year by the serum-simultaneous method, which died of swine erysipelas, whether or not

the disease was due to the inoculation. In 1927, for example, 410 of 213,173 inoculated pigs were lost, while in 1941, 65 of 222,770 were lost. An improvement in results was noted when, in 1934, a standard dose of 1 ml. of culture for all pigs was introduced, given together with 10 ml. of serum, or, in the case of young pigs, 1 ml. of serum per 10 kg. body weight. Immunity induced by the simultaneous method lasted about nine months and was increased to 12 months by a second dose of culture. The culture used was compounded of several strains of reduced virulence. Occasional breakdowns were noted, due to a "flare-up" of the viruses of swine fever or of infectious gastro-enteritis. —E. COTCHIN.

TAMURA, J. T., & GIBBY, I. W. (1943). **Cultivation of Bacterium tularense in Simplified Liquid Media.**—*J. Bact.* **45.** 361–371. **301**

Descriptions are given of several simplified liquid media which supported growth of *Pasteurella tularensis* and in which continued serial transfer was possible without loss of initial virulence. Three basal media were used, *viz*, a synthetic medium of amino acids, a hydrolysed gelatin medium, and a hydrolysed casein medium. The first and last of these did not support growth, but heavy inoculation of the second was followed by scanty growth. Accessory factors for good growth were found in liver-cake extract, blood-cell extract, and biotin concentrate. Multiplication of the organism was not observed in the absence of cystine or cysteine. The production of alkali in liquid media was well demonstrated, but no soluble toxin could be detected. The NaCl tolerance of the organism was high: the optimum amount was 1% or over, and 2% was not inhibitory.—E. COTCHIN.

CUNNINGHAM, C. H. (1943). **Paratyphoid Infection in Quail.**—*Amer. J. vet. Res.* **4.** 190–193. **302**

An account is given of what C. considers to be the first reported *Salmonella bredeney* infection in quail. The infection occurred at a commercial hatchery, the disease in the chicks being acute with no diagnostic symptoms. Mortality was highest in chicks 3–9 days old and negligible in chicks of four weeks old. The only constant lesions observed P.M. in 34 chicks examined were enteritis and a friable yellow liver; *S. bredeney* was recovered from 19. The disease was reproduced in four quail chicks by intraperitoneal inoculation of a saline suspension of the isolated *S. bredeney*. No infection with salmonella was found in two infertile eggs and seven embryos from the affected hatchery. Whole blood agglutination tests of 45 mature quail from the hatchery were negative. It is concluded that the infection possibly occurred from a contaminated incubator at the time of hatching.—J. E. LANCASTER.

I. FELIX, A., & CALLOW, B. R. (1943). **Typing of Paratyphoid B Bacilli by Means of Vi Bacteriophage.** —*Brit. med. J.* July 31st. 127–130. **303**

II. HUTCHINSON, J. R. (1943). **A Note on the Value of Phage Typing in the Investigation of an Outbreak of Paratyphoid B Fever.**—*Ibid.* 130. **304**

I. An account is given of the frequent isolation of anti-O bacteriophages, attacking diverse species of *Salmonella*, from the faeces of paratyphoid B patients, convalescents, and carriers during the extensive outbreaks of this infection which occurred in 1941. Specific anti-Vi paratyphoid phages, which did not attack the other salmonella species, were isolated much more rarely by direct plating from faeces and usually from rough variants or from phage-contaminated smooth cultures of *S. paratyphi* B during subculture. Unlike anti-O phages, the anti-Vi phages could be adapted to develop a high specificity for particular *S. paratyphi* B strains, by subculturing a phage strain obtained from one outbreak on a *S. paratyphi* B strain from another outbreak. In this manner, four distinct types of Vi phage were identified for *S. paratyphi* B and these were employed for the typing of 714 strains isolated from paratyphoid B patients or carriers in Great Britain. Results showed that 93% of these belonged to the four types, most of the larger outbreaks in 1941 being caused by type 1 strains. The typing of *S. paratyphi* B strains from sporadic cases or outbreaks was considered by the authors to be a valuable epidemiological weapon.

II. The field findings and the results of phage typing of *S. paratyphi* B strains, isolated from the faeces of 12 primary cases of paratyphoid B fever in an outbreak and seven primary cases from the surrounding district during two months in 1941, were found to be identical. All the primary cases caused by type 2 strains in the affected area and the immediate neighbourhood were associated with one particular shop in which an excreter of type 2 bacilli was handling foodstuff, while the primary type 1 strains were recovered from patients in the affected area and district who had had no dealings with the shop in question.—R. O. MUIR.

QUIROGA, S. S., & MONTEVERDE, J. J. (1942). Investigación de salmonelas en los ganglios mesentéricos de cerdos normales. **[Investigation into the Presence of Salmonella in the Mesenteric Lymph Nodes of Normal Swine].**—*J. agron. vet., Univ. B. Aires, 1941.* pp. 69–82. **305**

Bacteriological examination of mesenteric lymph nodes from 70 apparently normal swine revealed the presence of salmonella in 16 cases. The strains isolated were *S. montevideo* (10), *S. typhi-murium* (1), *S. senftenberg* (1), *S. cholerae-suis* (1), *S. minnesota* (1), *S. panama* (1), and one strain which had not been completely identified.—ISOBEL W. BURTON.

RÖHRER. (1941). Zu der Arbeit von Dr. Lütje: Nochmals über die Enteritisvorkommnisse beim Schweine und die sich daraus ergebenden praktischen Folgerungen. **[Comment on Luetje's Article on Salmonella Infection in Swine].**—*Berl. Münch. tierärztl. Wschr.* Sept. 5th. 436–437. [See also *V. B.* **12.** 315]. **306**

R. states that although swine paratyphoid is rare in Germany as a primary disease (R. himself saw none during five years' work in the Rhineland), various members of the salmonella group may be associated with other pig diseases and be potentially dangerous to man.—D. L. ROBARTS.

LOTHE, H. (1943). **Clinical Observations on Methods of Control of Bovine Brucellosis.**—*J. Amer. vet. med. Ass.* **103.** 1–5. **307**

A practitioner describes his experiences with segregation control of bovine brucellosis and with vaccination with strain 19. In general, segregation methods did not prove very successful and slaughter with indemnity had in some cases been abandoned. Examples are also given of ten herds in which vaccination with strain 19 was adopted. Results in these herds were very satisfactory. A small percentage of adults vaccinated as calves and a larger percentage of animals vaccinated when older continued to give positive agglutination reactions.—S. J. GILBERT.

PAGNINI, U. (1939). I polli nella diffusione delle brucellosi. **[Spread of Brucellosis by Fowls].**—*Clin. vet., Milano.* **62.** 75–83. **308**

Investigating the possibility that fowls may play a part in the dissemination of brucellosis, P. fed birds with cultures of *Br. abortus*, and attempted to recover the organisms from the faeces by inoculation of g. pigs, and from the organs and eggs by cultural methods.

The organism was not demonstrable in the faeces 24 hours after one administration of culture, and was not detected in the organs ; agglutination tests remained negative.

When culture was given daily to fowls in large doses over a period of seven days, the aggln. titre rose to 1 : 200–1 : 800, six out of 50 g. pigs inoculated with faeces taken from these birds during this period contracted infection, and *Br. abortus* was recovered from the bone marrow of one fowl. The organism could not be detected in the 15 eggs laid by the birds under test. It is concluded that fowls are of little importance in the dissemination of brucellosis among domestic animals or man.—U. F. Richardson.

Stuckert, G. V. (1942). La brucelosis en la provincia de Córdoba, Argentina. **[Brucellosis in the Province of Cordoba, Argentina]**.—*Bol. Ofic. sanit. pan-amer.* **21.** 869–872. [English summary]. [Abst. from reprint in *Bol. mens. Direcc. Ganad., Montevideo.* **26.** 367–370]. **309**

The first case of *Brucella melitensis* infection in a human being in Córdoba, Argentina, was reported in 1922 and since then the number of patients has increased greatly. From investigations carried out, it appears that goats are the important source of infection, *Br. melitensis* infection of cows being very rare.—M. W.

MacLennan, J. D. (1943). **Anaerobic Infections of War Wounds in the Middle East.**—*Lancet.* **245.** 63–66, 94–99 & 123–126. **310**

In the North African campaign, gas gangrene affecting the muscles has been responsible for 0·32% of all wounds. The anaerobic clostridia most frequently isolated were *Clostridium welchii, Cl. oedematiens, Cl. septicum, Cl. histolyticum, Cl. bifermentans*, and *Cl. fallax*. In some instances, anaerobic streptococci appeared to be the primary cause.

It is emphasized that as the number of clostridia found in desert soils was extremely small, the main source of infection was probably the clothing of the patients.

No definite evidence was obtained that specific sera or sulphonamides were of value prophylactically, either alone or together. When used in treatment, a combination of specific serum with sulphathiazole gave a recovery rate of about 75%.—R. E. Glover.

Quortrup, E. R., & Sudheimer, R. L. (1943). **Some Ecological Relations of *Pseudomonas aeruginosa* to *Clostridium botulinum* Type C.**—*J. Bact.* **45.** 551–554. **311**

Ps. aeruginosa was isolated regularly from water samples collected from many duck marshes, and also from the intestinal tract of six species of wild ducks. The organism had marked powers of consuming oxygen, and of rendering alkaline the medium in which it was growing. Cultures of *Cl. botulinum* Type C in broth produced enhanced amounts of toxin when *Ps. aeruginosa* was grown in symbiosis. This mixture of organisms also yielded toxin when grown in water containing common marsh plants (*Salicornia, Potamogeton, Cladophora*), and the final product, which closely simulated decaying vegetation, produced typical duck sickness when fed to ducks. *Ps. aeruginosa* is incriminated as a factor in the occurrence of botulism in areas where it is normally not expected, *e.g.*, where the water is more than 12 in. deep, but contains masses of decaying vegetation.—J. Keppie.

Evans, D. G. (1943). **The Protective Properties of the Alpha Antitoxin and Theta Antihaemolysin Occurring in *Cl. welchii* Type A Antiserum.**—*Brit. J. exp. Path.* **24.** 81–88. **312**

A technique is described for producing *Clostridium welchii* gas-gangrene in the g. pig. 0·2 ml. of 15% $CaCl_2$ is first injected intramuscularly into the shaven thigh, to be followed three hours later by 0·2 ml. of a washed suspension of *Cl. welchii* Type A at the same site.

When antitoxins were being tested, they were injected subcutaneously, in measured amounts, three hours before the infection.

Quite small amounts of α-antitoxin successfully protected the g. pigs against very many lethal doses, whereas the θ-antihaemolysin failed to protect against even the weakest infections. The addition of unconcentrated θ-antihaemolysin to effective prophylactic doses of purified α-antitoxin tended to diminish the efficacy of the α-antitoxin. Further work suggested that the nonspecific material present in horse serum reduces the rate of absorption of purified antibody.—J. Keppie.

Guillaumie, M. (1942). Activité anti-protéolytique de divers sérums vis-à-vis de la toxine *perfringens*. **[Anti-Proteolytic Action of Various Sera on *Clostridium welchii* Toxin]**.—*C. R. Soc. Biol. Paris.* **136.** 452–453. **313**

A comparison was made between the antitoxins of *Cl. welchii* and *Cl. histolyticum* as regards their ability to inhibit the proteases of a precipitated *welchii* toxin. Some weak cross-inhibition was demonstrable, but it was concluded that these enzymes are, to a certain degree, specific.—J. Keppie.

Pacheco, G., & Costa, G. A. (1941). Influência do oxigênio sob pressão sobre o " Clostridium welchii ". **[Influence of Oxygen under Pressure on *Cl. welchii*]**.—*Rev. brasil. Biol.* **1.** 145–154. [English summary]. **314**

Either air or O_2 under a pressure of 3 atm. resulted in the death of almost the whole of a culture of *Cl. welchii*. Only sporing forms survived, and as their formation was rather more favoured by the O_2, there were more viable organisms in compressed O_2 than in air.—J. G. Carr.

Hayward, N. J. (1943). **The Rapid Identification of *Cl. welchii* by Nagler Tests in Plate Cultures.**—*J. Path. Bact.* **55.** 285–293. **315**

A description of a rapid cultural method for the accurate identification of *Clostridium welchii*. Nutrient agar plates are used containing 20% human serum, and if possible, 5% Filde's peptic digest of sheep blood. Suspected material may be directly plated on to this medium. Colonies of *Cl. welchii* become surrounded within 18 hours by opaque zones caused by the interaction of the α-toxin with the serum. The accuracy of the diagnosis is increased if this Nagler reaction is inhibited on half of the plate by the use of 50–100 I.U. *Cl. welchii* antitoxin. The Nagler plate was proved superior to the blood-agar plate in detecting *Cl. welchii* [presumably Type A] in a large number of samples of infected muscles, faeces, cervical exudate etc. A positive reaction which is inhibited by *welchii* antitoxin is almost specific for *Cl. welchii*. Certain strains of *Cl. bifermentans, Cl. sordellii*, and *Cl. centrosporogenes* behave similarly, although much more feebly. Such organisms are readily distinguished by their readiness to sporulate and their proteolytic activity.

—J. Keppie.

Spalatin, J., & Dinter, Z. (1942). Beitrag zur Typisierung der Gasödemerreger. **[Type Determination of Gas Gangrene Organisms]**.—*Zbl. Bakt. I.* (*Orig.*). **148.** 395–398. **316**

Using 10 strains of *Clostridium chauvoei*, 17 strains of *Cl. septicum*, 2 strains of *Cl. novyi*, and 5 strains of *Cl. welchii*, the authors found that the production of colour from prontosil added to the medium was of no

assistance in differentiating the species, but that all the *Cl. septicum* strains decomposed aesculin, while all the others failed to attack it.—J. G. CARR.

BOTVINIK, I., PECK, S. M., & SCHWARTZ, L. (1943). **An Outbreak of *Microsporon lanosum* Infection from a Kitten.**—*Publ. Hlth Rep., Wash.* **58.** 317–319. **317**

M. lanosum infection was transmitted from a kitten to three children, and from one of the children to an adult. The infection was limited to the glabrous skin.

Examination of the kitten revealed scaling around the nose and infected hairs around the ears and head. —ISOBEL W. BURTON.

EMMONS, C. W., & ASHBURN, L. L. (1942). **The Isolation of *Haplosporangium parvum* n. sp. and *Coccidioides immitis* from Wild Rodents. Their Relationship to Coccidioidomycosis.**—*Publ. Hlth Rep., Wash.* **57.** 1715–1727. **318**

C. immitis was found in five of 150 soil samples taken from three different areas in San Carlos, Arizona. Since it is believed that wild rodents may form reservoirs of coccidiomycotic infections for man, 303 rodents were trapped in this region, including areas in which the fungus had been isolated from the soil, and 128 (42%) were found to have fungus infections. Lesions were observed in 55 animals and fungi were isolated from 46 of these, as well as from 71 in which no lesions were found. *C. immitis* was isolated in 25 cases and a new fungus, *H. parvum*, which is described in detail, in 101 cases. In nine cases both fungi were isolated from the same animal.

The histology of the lung lesions found in these animals is discussed; a comparison of the nodules produced by both fungi and the results of skin tests suggested that *H. parvum* may be aetiologically related to granulomas indistinguishable from those produced in rodents by *C. immitis*.—M. L. BINGHAM.

See also absts. **475** (staphylococcus enterotoxin), **395** (staphylococcus toxoid in tick pyaemia), **440** (anti-streptococcal substance), **446** (TB. chemotherapy), **402** (TB. and nutrition), **454** (fowl coryza), **445** (*Bact. coli* and sulphonamides), **447** (pullorum disease treatment), **501** (brucellosis), **355** (*Cl. welchii* toxin and antitoxin), **476-480** (culture of bacteria), **485**, **486** (culture of anaerobes).

DISEASES CAUSED BY PROTOZOAN PARASITES

TRAINER, J. B. (1942). **Studies on Hexamitiasis in the Chicken and Turkey.**—*Bull. Univ. Wash.* **6.** 201–202. **319**

This is an abstract of a thesis presented to the University of Washington on a study of diseases of turkey flocks in the state of Washington. Coccidiosis and blackhead occurred in more than half the flocks and 16 other diseases occurred in 4–18% of the flocks.

A special study was made on the prevalence of "nonspecific enteritis", which has been found to be commonly associated with *Hexamita* infection. Attempts to cultivate *Hexamita* in Locke's-egg-albumin medium was unsuccessful, but viable cysts of the organism will persist in it for long periods.

Young turkey poults inoculated with material from rats, infected with *Hexamita*, developed evidence of severe enteritis which was fatal in some cases, and in-contact birds contracted infection from them. The clinical symptoms were a gradual decline in growth rate, with a marked terminal dehydration and emaciation. It is concluded that *Hexamita* of rat origin is transmissible to, and pathogenic for, young turkeys.

Older turkey poults, inoculated with rat material, showed only mild diarrhoea, but at six months old weighed only 11–13 lb., against an average weight of 17 lb. regarded as normal for birds of that age. —U. F. RICHARDSON.

HARDCASTLE, A. B. (1943). **A Check List and Host-index of the Species of the Protozoan Genus *Eimeria*.**—*Proc. helminth. Soc. Wash.* **10.** 35–69. **320**

It is very necessary that an up-to-date check list of a rapidly growing genus should be published at intervals. Synonymy of the nomenclature appears to be complete in this list. The list of species and specific names not yet regarded as valid is welcomed by the worker who is somewhat alarmed by the seemingly unending multiplication of species. A host-index ranging from annelids to mammals adds to the value of the list as a work of reference. There is an excellent bibliography.—C. HORTON SMITH.

BEACH, J. R. (1943). **A Rapid Method for Quantitative Counts of Coccidial Oocysts in Chicken Feces.**—*Cornell Vet.* **33.** 308–310. **321**

Where large numbers of oocyst counts are necessary, any method is of value which may reduce the time factor without loss of accuracy. The method here described, an adaptation of the procedure for counting blood cells, employs a Rafter counting apparatus. Faeces collected at the end of the required period are thoroughly mixed to a thick paste in a measured amount of water which is always an even multiple of the weight of the faeces. 10 g. of this faeces mixture is suspended in 50 ml. water and filtered through gauze. The filtrate is centrifuged for 15 min., the supernatant fluid is decanted off, and the sediment is suspended in 10 ml. of 5% NaOH which makes a much less cloudy suspension than water and so increases the visibility of the oocysts when they have settled at the bottom of the 1 mm. deep counting chamber. One-tenth or 0·2 ml. [*sic*] of the suspension is transferred to a small tube and diluted with more NaOH solution to assist recognition of the oocysts on the bottom of the counting chamber. A 1 : 5 dilution usually suffices. A coverslip is placed over the Rafter slide and the chamber is then filled with 0·4 ml. of the diluted suspension of sediment. The count is made on the number of oocysts in 50–200 fields. A simple formula is given for finding the number of oocysts per ml. of suspension.—C. HORTON SMITH.

TROISIER, J., KOLOCHINE-ERBER, B., & SIFFERLEN, J. (1940). Une épizootie de leptospirose ictérique dans un chenil. Identification sérologique de l'agent pathogène. **[Outbreak of Leptospirosis in a Dog Kennels. Serological Identification of the Causal Agent].**—*Ann. Inst. Pasteur.* **65.** 371–385. **322**

In the study of four fatal cases of canine jaundice associated with azotaemia and albuminuria, leptospira were detected only in one field of one kidney smear, and cultures were not obtainable from canine material. The inoculation of blood of the affected dogs into g. pigs caused a leptospirosis in these animals, and cultures of a leptospira were obtained from g. pig material. Two adult dogs in the kennels proved immune to the organism, but a young dog succumbed to inoculation with infected g. pig blood.

Sera from the two immune dogs and from the infected animals agglutinated *L. canicola* in low dilutions only (1 : 100), except in one case. Agglutination in high dilutions was given with a laboratory strain of *L. icterohaemorrhagiae*, but even then the titre was not as great as with the organism isolated from the affected dogs.

It is concluded that the disease was due to a dog-adapted strain of *L. icterohaemorrhagiae*.—U. F. R.

JANEFF, E. (1943). Der erste Befund von Spirochaeta theileri (Laveran 1904) in Bulgarien. [*Treponema theileri* **Found for the First Time in Bulgaria**].—*Z. InfektKr. Haustiere.* **59.** 225–227. **323**

The detection is recorded in Bulgaria of a spirochaetal infection in the blood of a cow with piroplasmosis. The organisms varied in length from 3·65–14·6μ, and thick and thin forms were present. It is suggested that the organism was identical with *T. theileri*. The infected cow died, but the lesions were similar to those of piroplasmosis.—U. F. RICHARDSON.

SREENIVASAN, M. K., & SANKARANARAYAN, N. S. (1943). **Spirochaetosis of Fowls in India—I. II.**—*Vet. J.* **99.** 208–214, 236–243 & 255–258. **324**

For maintaining strains of spirochaetes, infected blood was stored in a refrigerator with sodium citrate and passaged through fowls once in three weeks. Some indications were obtained that the refrigeration caused an attenuation of the organisms.

After inoculation, the incubation period varied from 1–5 days, the disease starting with a febrile reaction followed in 12–24 hours by the appearance of spirochaetes in the blood. The birds became dull and assumed a position with the head buried in the feathers of the back. Early thirst was followed by profuse diarrhoea and rapid emaciation. The mortality is said to be high, and it is noted that more than 60% of the birds that died under experiment showed extensive visceral gout.

The blood, under dark-ground illumination, shows the parasites, and also small actively moving coccoid bodies which may be the so-called " Balfour's granules ". Apart from anaemia, the most important haematological change is a leucocytosis chiefly of the polynuclear type. The parasites disappear from the blood after death, and smears from the spleen, liver, and heart taken about three hours after death failed to reveal the organisms.

Immunization by the inoculation of refrigerated blood resulted in considerable mortality if the blood had been refrigerated for less than 45 days, but blood refrigerated 45 days or longer did not cause death although reactions occurred. [No test of the immunity conferred by these reactions appears to have been carried out.]

The serum of recovered fowls did not give sufficient protection for the simultaneous infective blood and antiserum method of immunization to be satisfactory.

Atoxyl in doses of 0·03–0·05 g. per kg. body weight proved toxic, as did soamin in doses of $\frac{1}{4}$–$\frac{1}{2}$ grain. Sulpharsenol in doses of 0·015 g. per bird given intramuscularly gave good results in treatment, and appeared to be protective if given up to 72 hours before the administration of infected blood. It is noted that although no reaction was given by the birds treated with sulpharsenol before the infective inoculation, they later proved to be immune.

Tests of the duration of immunity suggested that it was high for eight months, but after that declined rapidly.—U. F. RICHARDSON.

See also absts. **412** (biotin deficiency and *Trypanosoma lewisi*), **451** (tetse fly control), **448** (bovine coccidiosis), **450** (rabbit syphilis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

FRIEDEMANN, U. (1943). **Permeability of the Blood-Brain Barrier to Neurotropic Viruses.**—*Arch. Path.* **35.** 912–931. **325**

In a previous review [*V. B.* **13.** 64, abst. 412.], F. reached the following conclusions :– (1) the term " blood-brain barrier " expresses a selective permeability of the capillaries of the central nervous system ; (2) the ability of aniline dyes, toxins, antibodies, and drugs to pass the walls of these capillaries is determined by the electrical charge on each of these substances, and (3) the capillaries of the c.n.s. are permeable to electropositive and electroneutral substances, but impermeable to electronegative ones.

Diametrically opposed views are held concerning the permeability of the blood-brain barrier to neurotropic viruses. After reviewing the evidence, F. concludes that it is impermeable to the majority of neurotropic viruses. The evidence to that effect is conclusive, or at least highly suggestive, for the viruses of poliomyelitis, rabies, Borna disease, herpes simplex, louping ill, pseudorabies, St. Louis encephalitis, vesicular stomatitis, the neurotropic strain of yellow fever, and for equine encephalomyelitis in mice and aged g. pigs. Virus B, when injected subcutaneously, also reaches the c.n.s. exclusively by the neural route, but at present it is impossible to ascertain that it is unable to pass the blood-brain barrier.

In young g. pigs, the virus of E.E. passes directly through the wall of the cerebral capillaries ; but this passage cannot be considered a physiochemical process. It is mediated by the multiplication of the virus within the endothelial cells. The same mechanism is probably operative in the case of the virus of canine distemper.

The only virus to which the blood-brain barrier is permeable in a physicochemical sense is the pantropic virus of fowl plague. This, however, holds true only for highly virulent strains in chickens, mice, and g. pigs.

Experiments are tabulated showing that those viruses, which will not pass the blood-brain barrier, are negatively charged at the pH of the blood ; there is evidence that the virus of fowl plague is iso-electric at this pH. It is pointed out that, at least, these facts do not disprove the theory that the ability of particles to traverse the blood-brain barrier depends on electrical charge.—JOHN FRANCIS.

IWANOFF, X. (1941). Ueber das Wesen der filtrierbaren Vira. [**The Nature of Filtrable Viruses**].—*Tierärztl. Rdsch.* **47.** 393–397. **326**

After a brief review of well known work on the nature of viruses, the author describes his own observations on the histopathology of sheep-pox, foot and mouth disease, and swine fever. There are nine illustrations demonstrating the presence of " *Leptoplasmen* " in these diseases. " *Leptoplasmen* " appear to be largely elementary bodies resembling those of trachoma and lymphogranuloma inguinale.—JOHN FRANCIS.

I. MACLEOD, K. (1943). **Foot-and-mouth Disease in Man. [Correspondence].**—*Brit. med. J.* March 6th. 300. [See also *V. B.* **13.** 282, abst. 1869]. **327**

II. PARKER, G. S. (1943). **Foot-and-Mouth Disease in Man. [Correspondence].**—*Ibid.* March 20th. 365. **328**

III. MONRO, J. C. (1943). **Foot-and-Mouth Disease in Man. [Correspondence].**—*Ibid.* April 24th. 520–521. **329**

IV. MACLEOD, K. I. E. (1943). **Foot-and-Mouth Disease in Man. [Correspondence].**—*Ibid.* May 8th. 582–583. **330**

V. HORNE, J. L. (1943). **Foot-and-Mouth Disease in Man. [Correspondence].**—*Ibid.* May 15th. 614. **331**

I. This is the case of a child believed by the author to be infected with F. & M. disease. She lived in a cottage adjacent to two infected farms. It is stated

that the child had no direct contact with the disease, but that she skirted these farms on her way to school. Milk was obtained from a clean source. The patient was fevered, cyanosed, and salivating. There were multiple vesicles and small yellow ulcers inside the lips and cheek, and on the palate, gums, surface of the tongue, and pharynx. The breath was foul and there was abdominal discomfort and severe thirst. The peculiar pungent odour emanating from the patient is stressed. No laboratory tests were made. Recovery was almost complete in seven days.

II. Another case is described, in a youth of 18, which started with small areas of erythema on the gums, cheek, and hard and soft palates. These then formed into greyish-white vesicles containing a thin serous fluid and finally into shallow ulcers. Similar lesions developed on the feet. The patient had a slight temperature for four days. There was a marked improvement about the 12th day and gradual recovery. He had had two previous mild attacks within three years which showed that he had developed no immunity. Again there was no contact with animals, but milk is thought to have been a likely source of infection.

III. M. suggests that it would be interesting to know more of the convalescence of the case reported in I. He points out that adult human beings have a high degree of immunity even to direct contact with F. & M. disease, and he questions whether merely walking past an infected farm could give rise to infection in a child. He suggests that the case described in I may have been Vincent's angina.

IV. In reply to III, it is pointed out that convalescence was complete in four weeks. Again the author emphasizes the presence of an intense, penetrating and sickly sweet odour.

V. Having seen the case described in I, H. supports the diagnosis of F. & M. disease. He rules out the possibility of Vincent's angina.

[It is well known that man is highly resistant to F. & M. disease, even to direct contact. POPE (1921) and TRAUTWEIN (1930) have recorded two cases of accidental infection, with marked vesicular eruption chiefly at the site of inoculation. One of these cases was confirmed by animal inoculation. The peculiar odour referred to in the correspondence is not found in infected animals. That one patient could suffer from three attacks is quite possible, since there are three types of the virus, and no cross immunity.]—W. J. McI.

ROSSI, F. A., SCHANG, P. J., & CAMPION, R. L. (1942). Ensayos realizados en el país con la vacuna antiaftosa tipo Waldmann. [**Experiences with Waldmann's Foot and Mouth Disease Vaccine**].—*Gac. vet., B. Aires.* **4.** 172–179. [English and French summaries]. **332**

The authors carried out experimental and field vaccination against F. & M. disease with a Waldmann type, trivalent vaccine on 20,000 pigs, 2,000 cattle, and 300 sheep.

The vaccine was found to be harmless and produced a strong immunity which lasted up to four months, and then gradually decreased. Under purely experimental conditions, immunity lasted as much as six months.

—MILLER WATSON.

SCHANG, P. J., ROSSI, F. A., & ARAMENDI, M. C. (1942). Técnica para la obtención de suero antiaftoso polivalente hiperactivo. [**Technique of Production of Polyvalent Hyperimmune Serum against Foot and Mouth Disease**].—*Gac. vet., B. Aires.* **4.** 163–172. [English and French summaries]. **333**

A hyperimmune serum against F. & M. disease was prepared by giving massive doses of the three types of virus to cattle more than four months after the original infection. This serum was found to be 5–10 times more effective than the mixed sera of convalescent animals. It is stated that the serum was useful in cattle, but that it was still found convenient to practise some degree of isolation during treatment with the serum; this was unnecessary with pigs in which the serum proved even more effective.—MILLER WATSON.

SNYMAN, P. S. (1940). **The Study and Control of the Vectors of Rabies in South Africa.**—*Onderstepoort J. vet. Sci.* **15.** 9–140. **334**

In South Africa, the dog is a negligible factor in the transmission of rabies which is almost entirely associated with certain species of small wild carnivores. In discussing the subject, S. deals with (1) the distribution of the disease, (2) the occurrence of the disease in definite foci or centres, (3) the origin of the disease in fresh outbreaks, (4) the spread of the disease, (5) the possibility of a seasonal influence, and (6) the epizootics which occurred between November, 1928, and August, 1939.

The distribution of the disease follows very closely the main distribution of the red meercat or yellow mongoose (*Cynictis penicillata*). Although the disease is widespread over a large part of the country, it is restricted to more or less well defined centres over the greater part of that area. As to the origin of the disease in new outbreaks, S. suggests that the outbreaks were not new, but that the disease had been smouldering without cases having been seen. Little is known about the migratory habits of the principal carriers, *Cynictis* and other Viverridae. The incubation period, which may last up to six months, would allow migration over a long distance. It is noted that apparent increases in the incidence of rabies coincide with periods when the vegetation is short or non-existent; this may be due to the facts that at these times meercats traverse larger areas in search of food and that, when rabid, the scanty vegetation allows them to be more easily seen. A description of the vectors of the disease is given and includes the meercat, ground squirrel (*Geosciurus capensis capensis*), suricate (*Suricata suricatta hamiltonis*), polecat (*Ictonyx striatus striatus*), spotted genet (*Genetta felina felina*), and the wild cat (*Felis ocreata caffra*). A very interesting chapter on the formation of meercat burrows is given. Some of the burrows are very intricate and extend over a large area. The various methods of destroying meercats by gassing the burrows is described in considerable detail. Of the various methods tried, gassing of the burrows with calcium cyanide followed by trapping has proved the most effective. The value of propaganda to distribute knowledge about the disease, especially the dangers associated with meercats, is emphasized.—E. M. ROBINSON.

DE BETTENCOURT, A. (1942). Le traitement antirabique à l'Institut Câmara Pestana (1938–1942). [**Antirabies Treatment at the Camara Pestana Bacteriological Institute, 1938–42**].—*Arq. Inst. bact. Cam. Pest.* **8.** 229–239. [In French]. **335**

Statistics are given concerning antirabic treatment carried out by the Lisbon Institute from 1938–42. Altogether, 5,377 persons were treated, five of whom died. There were six cases of nervous complications following vaccination, only one of which proved fatal. During the period, findings were positive in 198 of 1,151 brains of animals sent to the Institute for rabies diagnosis.—ISOBEL W. BURTON.

—. (1942). Profilaxis de la rabia. [**Prevention of Rabies**].—*Gac. vet., B. Aires.* **4.** 161. **336**

This is an editorial calling for a more coherent policy with regard to the prophylaxis of rabies in the Argentine.

It comments on the fact that the authorities in Rosario have made antirabies vaccination compulsory, while in Buenos Aires only police measures are carried out. The editorial states that while police measures kept rabies under control in Germany for ten years, this form of prophylaxis finally broke down because preventive vaccination was not carried out simultaneously.—MILLER WATSON.

DUNLAP, G. L. (1943). **Comparative Value of Brains and Cords of Sheep in Rabies Vaccine.**—*J. Amer. vet. med. Ass.* **103.** 11–14. **337**

The virus content of the material used in preparing rabies vaccine is in direct relation to its immunizing value. The virus contents of sheep brain and sheep cord are compared experimentally, results showing that brain tissue from sheep inoculated with rabies fixed virus contained 100 times or more virus than the cord. There was a wide variation in the virus content of individual animals. In potency tests, vaccines prepared from cords alone gave practically no protection. Those prepared from brains or mixtures of brain and cord showed a high degree of protection.—S. J. GILBERT.

DAWSON, J. R., Jr. (1942). **A Pathological Study of Rabies in the Chick Embryo.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 197–200. **338**

A brief study of the lesions produced in chick embryos by rabies virus. The virus was obtained originally from dog brain and passed intracerebrally through a mouse and three-day-old chicks and then maintained by serial passage in 13-day-old chick embryos. The only gross change in chick embryos was hydrocephalus, which occurred frequently. The chief lesions were microscopic and these are described.

—S. J. GILBERT.

DE OLIVEIRA, J. C. (1942). Sôbre o vírus rábico e seus métodos de cultura. **[Cultivation of Rabies Virus].**—*Arq. Inst. bact. Cam. Pest.* **8.** 11–131. [English, French and German summaries]. **339**

This work was undertaken in order to find a suitable medium for the growth of rabies virus, apart from nervous tissue. Attempts to cultivate both fixed and street viruses on the chorio-allantoic membranes of chick embryos 10–17 days old were unsuccessful. It was found that inoculation of the membranes did not provoke any specific histological alteration.

The possibility of altering the membrane by treatment with X-rays, in order to make it more suitable for propagation, was investigated without success. The addition of vitamin C to the inoculum also had no beneficial effect on the propagation of the virus.

The best results were obtained with 4–5 day embryonated eggs, through which the virus was passaged nine times (after which the strain was lost through lack of fertile eggs). The presence of virus was detected as far as the ninth passage by the intracerebral inoculation of mice with material collected after ten days' growth, in a dilution of 10^{-2}. The same material proved to have immunizing properties for the mouse on intraperitoneal inoculation.

In no case did the infective titre rise, but it was shown that the virus multiplied more actively in the brain of the embryo than in the chorio-allantoic membrane.

[The evidence that virus was actually propagated, and not merely transferred from egg to egg, does not appear to be entirely conclusive.]—ISOBEL W. BURTON.

MORCOS, Z. (1943). **Pigeon Pox (May, 1943).**—*Vet. J.* **99.** 219–223. **340**

An account of a few experiments carried out, most of them without controls.—C. V. WATKINS.

STOKES, J., & HENLE, W. (1942). **Studies on Methods of Prevention of Epidemic Influenza.**—*J. Amer. med. Ass.* **120.** 16–20. **341**

The control of influenza epidemics is considered under three headings :– (a) distribution of infective airborne particles, (b) vaccination, and (c) the use of immune serum.

(a) Groups of 70 mice were exposed to influenza A virus atomized into the air for a period of 2½ hours. In the first group, the upper part of the cubicles containing the mice was subjected to radiation with ultra-violet light; in the second (control group), no agent was used; in the third group, propylene glycol was vapourized to give a concentration of $1 : 2 \times 10^6$ to $1 : 4 \times 10^6$. All of the 70 control mice died within ten days; in the irradiated group, 12 showed slight lesions; while in the propylene glycol experiment, only three showed lesions. In general, both methods were highly effective in preventing air-borne infection.

Confirmatory evidence of the value of these methods in reducing the incidence of respiratory infections in children is given.

(b) In testing the efficacy of vaccine, 72 boys (44 vaccinated and 28 controls) were used. The vaccinated subjects received inactivated allantoic fluid vaccine, (influenza A). The whole group was then deliberately exposed to infection by exposure to atomized allantoic fluid inhaled through masks for 4 min. There was only one case of clinical influenza in the vaccinated group (3%) as compared with ten cases (35%) in the controls, although some of the protected patients may have had a subclinical attack.

(c) Experiments on passive protection of mice with immune serum showed that relatively small amounts were needed when serum was inhaled, as compared with the amount required when given by the intravenous or intraperitoneal routes. Results obtained in ferrets were less striking, but it is suggested that technical improvements in the methods of atomizing serum may increase its effectiveness.—R. E. GLOVER.

GÖNNERT, R. (1941). Die Bronchopneumonie, eine neue Viruskrankheit der Maus. **[Broncho-Pneumonia, a New Virus Disease of the Mouse].**—*Zbl. Bakt. I. (Orig.).* **147.** 161–174. **342**

The elementary bodies of this virus were observed during a study of ectromelia, and it was then found that, by the use of the intranasal method of inoculation, the disease could be produced after 2–4 blind passages of lung material from apparently healthy mice. The first day after infection, the mouse may appear normal but the breathing soon becomes superficial and anorexia develops. The disease may run an acute or subacute course. If the mouse dies at an early stage, the lungs have a dark brown-red appearance due to the presence of blood. Later, spreading from the hilus, a grey colouration develops. The lungs are swollen and tense and the pleura glazed.

In Giemsa-stained preparations, large red or violet intra- and extra-cellular elementary bodies are observed, closely resembling those of psittacosis, trachoma, and lymphogranuloma inguinale. A developmental cycle is described and illustrated.—JOHN FRANCIS.

WAGENER, K. (1940). Kriegsbeobachtungen über das Auftreten des ansteckenden Katarrhs der Luftwege beim Pferde. **[War Observations on the Occurrence of Equine Infectious Bronchitis].**—*Dtsch. tierärztl. Wschr.* **48.** 653–655. **343**

An account of clinical observations on outbreaks of infectious catarrh in army horses. W. considers the disease to be due to the combined action of a virus and a haemolytic streptococcus.—JOHN FRANCIS.

Nieschulz, O. (1942). Untersuchungen über die Ueberträgerfrage bei der afrikanischen Pferdesterbe. [**Research on the Transmission of African Horse-Sickness**].—*Dtsch. tierärztl. Wschr.* **50.** 137–138. **344**

The method of transmission of South African horse sickness is discussed. Its seasonal prevalence, and the comparative freedom from the disease of horses kept in protected stables at night suggest the mosquito as the probable transmitter. A mosquito survey at Onderstepoort suggested that the vector was probably an *Anopheles* or *Aëdes*, as species of *Culex* were present at all seasons of the year. Successful transmission was obtained by the injection of triturated mosquitoes of the species *C. theileri*, *Aëdes caballus*, *A. hirsutus*, *A. lineatopennis*, *Anopheles gambiae*, *A. mauritianus*, and *A. pretorius* when the injections were made ½–7 days after the insects had fed on an infected horse, but when longer periods were allowed to elapse, all attempts to infect by the injection of mosquito preparations failed. In view of the great power of survival of the horse sickness virus, it is concluded that the vector is not a mosquito.—U. F. Richardson.

Chaddock, T. T. (1943). **Facts Concerning Distemper in Mink and Other Present Day Problems.**—*Amer. Fur. Breed.* **15.** No. 8. 18–22. **345**

C. notes the large increase of distemper in mink in Winsconsin, despite increased anti-distemper vaccination in recent years. Swollen plantar pads and a reddish-grey dandruff on the chest and abdomen are typical clinical signs of the disease. A further aid to diagnosis is the finding of inclusion bodies in the mucous membrane of the bladder. These bodies are more regularly observed in animals which die than in those killed for examination. Immunization is discussed.

C., as a result of over 50,000 P.M. examinations, lists mink diseases in the following order of importance :– pneumonia, malnutrition, distemper, food poisoning, urinary calculi, gastro-enteritis, screw fly [*? Cochliomyia americana* infestation], fur chewing, sporadic outbreaks (including botulism), and acidosis.—C. V. Watkins.

Howe, H. A., & Bodian, D. (1942). **Neural Mechanisms in Poliomyelitis.** pp. viii+234. New York : Commonwealth Fund. London : Humphrey Milford. Oxford University Press. [20s.] **346**

The spread of poliomyelitis virus in the tissues is largely a question of the part played by nerve fibres and nerve cells. Thus, migration of virus along the sciatic nerve occurs with regularity if sufficient fibres of the cut end are immersed in virus suspensions. Degeneration of nerve fibres induced by momentary freezing at a point central to inoculation, prevents passage of the virus. Susceptibility is restored as soon as a sufficient number of the fibres have regenerated, indicating that the actual transmission takes place along the axon protoplasm.

Experiments in monkeys subjected to hemidecortication show that the virus is not only neurotropic but also neuronotropic, *i.e.*, it has a special affinity for the neuron itself. If areas of the brain are damaged so as to destroy the neuron, other structures being left intact, the virus is unable to establish itself. When virus is introduced into the lateral geniculate body which is normally highly resistant, lesions fail to develop except in the region of the inoculum. It is postulated that the reaction is secondary to a chemical complex resulting from the interaction of virus with the susceptible neurons. When virus is prevented from migrating along a preferential pathway, it may use an indirect route such as the autonomic ganglia.

Although it is possible to observe certain differences in the distribution of lesions in the later stages of the disease, the final pathological picture, in most cases, is similar, suggesting that susceptibility of various parts of the nervous system is largely independent of the portal of entry. Any variation which does occur may well be due to immunological processes occurring in nerve cells receiving a sublethal dose of virus during the same or during a second attack of the disease. Several lines of evidence indicate that in rhesus monkeys the virus is almost exclusively neurotropic and quite incapable of penetrating barriers formed by non-nervous tissues. It does not follow, however, that in man the virus is not capable of movement by other routes. Thus, whilst in the monkey the olfactory mucous membrane and its associated nerves are the only natural route which is known, in man this pathway is not the usual one, since the nerves passing from the larynx to the central nervous system are commonly affected. Evidence regarding the role of the gastro-intestinal tract is less clear. Doubtless, proliferation of virus in this region does occur, but it does not prove that migration to the c.n.s. takes place by this channel. Critical evidence that the abdominal sympathetic system acts as a route from the gut to the spinal cord has been obtained only in the chimpanzee.

In the lower primates, the disease in the c.n.s. may be arrested spontaneously and may precede the paralytic stage, thus producing a " non-paralytic " attack. The main lesions in these cases are restricted to a destruction of neurons near the site of entry of virus into the c.n.s.

Experiments in monkeys or reinfection after recovery from a mild attack of the disease support the view that in man immunization is not the result of protection of the nervous system, but rather of some process which prevents infective quantities of virus from reaching the nervous tissues. It is thought that circulating antibodies exert little protective effect on the c.n.s. : they may, however, be of value in protecting the host at the portal of entry before the virus has invaded the nervous system.—R. E. Glover.

See also absts. **454** (fowl coryza), **381**, **382**, **399** (neoplastic viruses).

IMMUNITY

Geever, E. F. (1942). **The Relation of Allergy to Immunity in Experimental Tuberculosis.**—*Amer. J. clin. Path.* **12.** 606–616. **347**

The relationship between tuberculo-allergy as manifested by skin sensitivity and thermal reactivity (rectal temperature changes) to tuberculin and tuberculo-immunity was studied in a group of 13 male g. pigs which had been vaccinated subcutaneously with 1·0 mg. BCG. The animals were desensitized to both skin and thermal reactions by repeated tuberculin injections, the general finding being that thermal reactivity, which appeared to be a less accurate index of allergy than the skin reaction, disappeared sooner than did cutaneous sensitivity. The resistance of these desensitized animals, assessed by examination of the extent and type of the lesions exhibited at autopsy 12 weeks after inoculation with 0·0001 mg. of virulent human tubercle bacilli, was compared with that exhibited by the same number of similarly vaccinated and infected, undesensitized animals. No significant difference was found in the lesions exhibited by the two groups, both of which exhibited a considerable degree of resistance when compared with a control group of similarly infected, unvaccinated animals. This result, accordingly, appears to favour the view that tubercular allergy and immunity are separate and distinct phenomena [see Corper & Clark—*V. B.* **14.** 9, abst. 55].

—J. Lochiel McGirr.

CANETTI, G., & LACAZE, H. (1940). Données nouvelles sur l'évolution et la signification de l'allergie tuberculinique. (Premier mémoire). Les grandes tendances évolutives de l'allergie tuberculinique chez les sujets non tuberculeux. Allergie et réinfection. **[New Facts about Tuberculin Allergy. I. Great Tendency for Tuberculin Allergy to Develop in Non-Tuberculous Persons. Allergy and Reinfection].**—*Ann. Inst. Pasteur.* **65.** 435–468. **348**

The results of a series of intradermal tuberculin tests on 941 patients, hospitalized for various reasons but not showing any clinical symptoms of TB., are presented and discussed. Only 11% of the cases exhibited no signs of tuberculin allergy and an analysis of the others in age groups indicated that the degree of sensitivity increased steadily with age up to early middle life and then declined slowly with increasing age. The main factor responsible for the maintenance of allergy throughout adult life is held to be the supervention of reinfection which, in man, is apparently capable of rapidly raising the level of a fading allergy at least to its maximal primary-infection level. [This finding is in direct contrast to the results of the cattle reinfection (BCG) experiments of BUXTON *et al.*—*V. B.* **10.** 736.]—J. LOCHIEL MCGIRR.

FRISCH, A. W., TRIPP, J. T., BARRETT, C. D., Jr., & PIDGEON, B. E. (1942). **The Specific Polysaccharide Content of Pneumonic Lungs.**—*J. exp. Med.* **76.** 505–510. **349**

Specimens of lung tissue obtained P.M. from patients dying of pneumonia due to types I, II, III, VII, and VIII pneumococci were analysed for their specific carbohydrate (S) content by a method in which material, obtained by multiple alcohol precipitations of acetate buffer extracts from exudates expressed from the specimens, was subjected to quantitative precipitation procedures with the relative antiserum. The results obtained indicated that the S content of pneumonic lungs in type III cases was 60 times that in cases due to types I, II, VII, and VIII, the highest S values being obtained from grey hepatized lobes with large amounts also present in red hepatized and oedematous areas. Preliminary peptic digestion of the lung exudates was found to increase materially the amount of S obtained by the extraction procedure. The data presented are held to support the hypothesis that the outcome in type III pneumonia is related to the ability of the pneumococci to produce capsular polysaccharide.

—J. LOCHIEL MCGIRR.

LANDSTEINER, K., & CHASE, M. W. (1942). **Experiments on Transfer of Cutaneous Sensitivity to Simple Compounds.**—*Proc. Soc. exp. Biol., N.Y.* **49.** 688–690. **350**

This preliminary report gives experimental findings in relation to the passive transfer of skin sensitivity to simple compounds. The exudates resulting from intraperitoneal injections of picryl chloride conjugates [see *V. B.* **12.** 279.] in conjunction with killed tubercle bacilli into tuberculin-sensitive g. pigs were found to be capable of producing cutaneous sensitivity to picryl chloride when injected intraperitoneally into normal g. pigs. Evidence is presented which renders it unlikely that this skin reactivity was produced by active sensitization due to residual antigenic material in the peritoneal exudates. Definite results of this type were obtained with acyl chloride, *o*-chlorbenzoyl chloride, and citraconic anhydride, and sera from g. pigs which had been rendered highly sensitive to the last-mentioned substance were found to contain an antibody which, by intraperitoneal or intracutaneous injection, was capable of sensitizing normal g. pigs.—J. LOCHIEL MCGIRR.

AYO, C. (1943). **A Toxic Ocular Reaction. I. New Property of Shwartzman Toxins. II. On the Nature of the Reaction.**—*J. Immunol.* **46.** 113–125 & 127–132. **351**

I. Shwartzman toxins, *i.e.* bacterial filtrates (chiefly of Gram-negative micro-organisms) which produced a local tissue reaction by the combined use of local and intravenous injection, were shown to cause a primary toxic ocular reaction, characterized by irido-conjunctival hyperaemia and coagulability of the aqueous humour, appearing several minutes after intravenous injection and persisting for about 12 hours. The reaction was also elicited by other routes, but not by intestinal and ocular administration. Previous intracutaneous or intravenous injection of filtrates or moccasin snake venom prevented the appearance of the ocular reaction in rabbits. Physical properties of the toxins and specific neutralization by antitoxins are described. The Shwartzman phenomenon was reproduced in cats and dogs, but not in other laboratory animals, except for a certain percentage of g. pigs.

II. Physiological and histological studies of the toxic ocular reaction described in I demonstrated the importance of the fibrinogen system and permeability of the ciliary body, together with a moderate peri- and para-vascular leucocytosis of the uvea and retina. Retro-ocular injection of adrenalin protected against the toxic ocular reaction.—R. O. MUIR.

HARTLEY, P., EVANS, D. G., & HARTLEY, O. M. (1943). **Factors Affecting the Response of Immunised Guineapigs to Antigenic Stimulus.**—*Lancet.* **245.** 314–316. **352**

The experiment was made to determine whether adverse conditions such as restriction of diet, exposure to cold, or infection with *Clostridium welchii* Type A, producing varying degrees and severity of gas gangrene, affected the normal response to antigenic stimulus of animals immunized many months before with the same antigenic substance.

Approximately 90 g. pigs were first immunized by two inoculations of the equivalent of one Flocculation Unit each of diphtheria A.P.T. For the antigenic stimulus, each animal received a subcutaneous injection of the equivalent of 1 F.U. of the same substance. After ten days, the sera of the surviving animals were tested. All the animals showed an increase of antitoxin concentration. Of the g. pigs affected with varying degrees of gas gangrene, 22 out of 23 still responded to the antigenic stimulus to almost the same extent as did the normal controls. The other adverse conditions had but little effect on the antigenic response.—R. R. A. C.

I. KOERBER, W. L. (1943). **Evaluation of the Antigenicity of Tetanal Toxoid.**—*J. Immunol.* **46.** 391–398. **353**

II. KOERBER, W. L., & MOOK, G. E. (1943). **The Use of Mice in the Testing of Antigenic Power of Tetanal Toxoid.**—*Ibid.* 411–425. **354**

I. The flocculation test between concentrated toxin and purified antitoxin was satisfactory for testing the combining power of tetanus toxins. The average ratio of Lf : L+ was as 1 : 10. As is the case with other toxins and toxoids, *in vitro* values were not reliable indications of *in vivo* antigenicity. Thus there was no constant correlation between M.L.D.'s and antigenicity or between combining values (L+ or Lf) of tetanus toxins and the antigenicity of the corresponding toxoids. The most reliable method for assessing the antigenicity of tetanus toxoid is that carried out in g. pigs or mice.

II. Mice can be successfully used instead of g. pigs in the assay of both liquid and alum-precipitated toxoid. The more obvious advantages are :– the lower

cost, the choice of a reliable strain, and the decrease in the immunization period from six weeks to 2–3 weeks. Two procedures are described. A standard toxoid is necessary and also a standard tetanus toxin for use as the challenging dose (subcutaneously). It is shown that the M.L.D. of tetanus toxin for mice is only $\frac{1}{8}$th that for the g. pig.

The toxoid is injected by the intraperitoneal route. The percentage of mice surviving the fixed dose of toxin is a measure of the efficacy of the toxoid as an antigen. A more accurate quantitative value can be obtained from dosage-response curves according to the method given.—J. KEPPIE.

MILES, A. A., & MILES, E. M. (1943). **The Fixation of Foreign Material in Inflamed Tissue, with Especial Reference to the Action of *Cl. welchii* Toxin and Antitoxin.**—*Brit. J. exp. Path.* **24.** 95–107. **355**

The authors sought an explanation of the rapid decrease in the curative efficacy of antitoxin as the duration of a bacterial toxaemia increased. The theory that the lymphatics at the periphery of an inflamed area become blocked was especially examined.

The fate of refined *Clostridium welchii* antitoxin and also of dye was followed in rabbits in which a local area of inflammation had been induced by the intramuscular injection of *Cl. welchii* toxin or other irritants. During the period of inflammatory exudation, there was macroscopic dilatation of the lymphatics draining the oedematous area. The antitoxin titre in the swollen inflamed limb was much higher than the titre in the normal limb, in which it was negligible. The fate of excitants in the skin of rabbits and mice was also studied. No evidence was obtained to support the theory that thrombosis of the lymphatics is responsible for the accumulation of foreign material in the lesion, rather did it appear that for a time the dilated lymphatics were unable adequately to drain the early outflow of capillary exudate.

Antitoxin introduced into the circulation after the period of gross exudation would only penetrate slowly into the oedematous lesion, and become diluted. Other theories, and the relation of the present findings to the local treatment of acute inflammation, are discussed. —J. KEPPIE.

TURNER, J. C., & JACKSON, E. B. (1943). **Serological Specificity of an Auto-Antibody in Atypical Pneumonia.**—*Brit. J. exp. Path.* **24.** 121–126. **356**

Sera of patients with primary atypical pneumonia (A.P.) which have an effect on the red cells of the individual affected and upon the homologous group O cells, were compared with control sera for their content of cold agglutinins for the red cells of man. Erythrocytes from the rabbit, mouse, g. pig, horse, and sheep were agglutinated to high titres and to an equal extent by A.P. sera, but also by normal sera, *i.e.* they contained powerful hetero-agglutinins.

The auto-agglutinins were removed by absorption on red cells, followed by elution in saline at 37°C. The eluate was still active against human, rabbit, and g. pig cells, but not against those of other species. Absorption of the purified eluate with autologous cells removed the auto-agglutinins from human and g. pig sera, but not from rabbit serum. It is suggested that there is a heterogenic antigen which is shared by man and the rabbit. [See also *V. B.* **13.** 388, abst. 2617.]

—R. E. GLOVER.

SCHNITZER, R. J., & GODDARD, I. G. (1943). **Influence of Benzene-Poisoning upon Streptococcal Infections in Rabbits. I. Benzene-Poisoning and Natural Resistance to Intracutaneous Streptococcal Infection.** —*J. Immunol.* **46.** 133–142. **357**

SCHNITZER, R. J. (1943). **Influence of Benzene-Poisoning upon Streptococcal Infections in Rabbits. II. Benzene-Poisoning and Active and Passive Immunity to Intracutaneous Streptococcal Infection.** —*Ibid.* 143–150. **358**

I & II. By the repeated subcutaneous injection of benzene in rabbits, leucopenia could be induced. Such rabbits failed to develop a typical local lesion when infected intracutaneously with a group A streptococcus, but they died of septicaemia ; in control normal rabbits a progressive local inflammation was produced. The effect was then determined of immunizing rabbits against streptococci, treating them with benzene, and then giving an intracutaneous inoculation of a live strain of streptococcus. While infection was always fatal to non-immunized animals, 70% of immunized animals survived. A similar experiment was also attempted, the rabbits being sensitized with type-specific serum prior to infection ; the resultant local lesions did not react to trypan blue like an inflamed area. The significance of these findings is discussed and the conclusion is drawn that after active or passive immunization the local fixation of streptococci should mainly be attributed to the action of antibodies.—D. L. ROBARTS.

LONGFELLOW, D., & LUIPPOLD, G. F. (1942). **Typhoid Vaccine Studies. VI. The Production of Cross-Immunity Between Members of the Typhoid-Para-Typhoid Group of Microorganisms.**—*J. Immunol.* **45.** 249–260. [For part V, see *V. B.* **13.** 172]. **359**

The problem of cross-immunization between organisms of the typhoid-paratyphoid group was studied by animal experiments of two kinds :– determination of active immunity produced by typhoid, paratyphoid A, and paratyphoid B vaccines respectively to the homologous and the two heterologous strains, and assessment of passive immunity conferred by the administration of immune sera which had been produced in animals by the respective vaccines. The test animals were mice, and immune sera were produced in rabbits ; a small number of human immune sera were also used. The results, details of which are given, were of a conflicting nature. The tests for active cross-immunity seemed to indicate that it is negligible, while the tests for passive cross-immunity seemed to indicate that an appreciable degree of cross-immunization was produced by a vaccine of any one of these organisms against the other two. It was not possible to decide which determination was the more reliable for appraising cross-immunity between the organisms used.—E. C.

MCCLEAN, D. (1943). **Studies on Diffusing Factors. 2. Methods of Assay of Hyaluronidase and their Correlation with Skin Diffusing Activity.**—*Biochem. J.* **37.** 169–177. [For part I, see *V. B.* **11.** 616]. **360**

HUMPHREY, J. H. (1943). **Studies on Diffusing Factors. 3. A New Biological Assay of Diffusing Factor in Guinea-Pigs.**—*Ibid.* 177–181. **361**

[Authors' summaries copied *verbatim*].

2. A method of assaying hyaluronidase is described, which depends upon the destruction by the enzyme of the power of a substrate-protein complex to form a typical 'mucin clot' on the addition of acetic acid.

It appears that the destruction of the clotting power of the substrate is an early stage in its degradation, which can be detected before any appreciable fall in viscosity occurs.

Sera which inhibit the diffusing and viscosity-reducing activity of these enzymes also inhibit the mucin-clot prevention reaction. Sera prepared against enzymes obtained from *Cl. welchii* and *Vibrion septique* are species- but not type-specific. Those obtained against streptococcal enzymes are group- but not type-

specific. A serum prepared against diffusing factor from bull's testis inhibited this enzyme, but did not inhibit a testicular enzyme from the mouse, or any of the bacterial enzymes.

Both the apparent *p*H optimum of viscosity-reducing activity, and the titre of the enzyme, are markedly affected by the concentration and nature of salts in the system.

Nine enzymes from various sources have been examined for diffusing activity in the skin, by viscosimetry and by the mucin-clot prevention test. The conclusion is drawn that all three tests measure the activity of the same agent.

3. A method is described for assaying the activity of diffusing-factor preparations in the skin of guinea-pigs, whereby twofold differences in activity can be distinguished. This method, which is based on the determination of the least amount required to produce a 20% increase in bleb area, gives reasonable agreement with assays of the hyaluronidase content of the same preparations when this is estimated by the reduction of the viscosity of hyaluronic acid.

See also absts. **382** (antibodies against Rous sarcoma virus), **367** (serodiagnosis of taeniasis), **376** (skin reactions in nematode infestations), **458-460** (hypothermia in experimental infections).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

BENNISON, J. C. (1943). **Demodicosis of Horses with Particular Reference to Equine Members of the Genus Demodex.**—*J. R. Army vet. Cps.* **14.** 34–49 & 66–73. **362**

Little is known of demodicosis in horses, while the clinical significance of *Demodex* in skin lesions is obscure. An elongated variety of the parasite obtained from the eyelids and muzzle is designated *D. folliculorum* var. *equi*, and a shorter variety on other parts of the body, most commonly on the withers, neck, and quarters, is designated *D. equi*. Figures of the two forms are given while the morphological features are compared in a table. The relatively great length of the abdomen is one of the most marked features of *D. folliculorum* var. *equi*. It was found to be confined to the ducts and tissues of the Meibomian glands. On the other hand, it is suggested that *D. equi* inhabits the sebaceous glands and possibly the hair follicles. The life-history of *D. folliculorum* is detailed ; it is inferred that movement is below the superficial layers of the skin, since the parasites were not found in scrapings of the outer skin of the eyelid. A cyst-like reaction in the tissue of the Meibomian glands was noted in *D. folliculorum* var. *equi* infestation.

D. equi was present in 9% of 4,355 horses showing pruritus, and in 0·7% of normal horses. In a small percentage of cases of mange, it was found together with sarcoptic and psoroptic mites. The peak period for *D. equi* is July-August, but the incidence does not fall much below one-quarter of the peak value throughout the year. No evidence could be produced to show that infestation with these two mites is contagious. It is suggested that *D. equi* may, under certain conditions, *e.g.* scurfiness and dirt, cause pruritus. The sodium hyposulphite and hydrochloric acid treatment is advocated for *D. equi* infestation.—A. MILNE.

*EICHLER, W. (1941). Die Mallophagengattung Columbicola Ewing. [**The Genus *Columbicola***].—*S.B. Ges. naturf. Fr. Berl. 1940.* pp. 270–288. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 511]. **363**

E. gives a description of the species and subspecies of the genus *Columbicola* Ewing 1929 (formerly part of the genus *Esthiopterum*).—H. D. CROFTON.

*LANG, L. (1942). Beitrag zur Klärung der Frage der Pathogenität der Futtermilben, im besonderen von Tyroglyphus farinae de Geer. [**Research on Pathogenicity of Food Mites, particularly *T. farinae***]. —*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 434]. **364**

A review of the literature indicates that there are considerable differences of opinion as to whether mite-infested food is toxic, and if so, as to the reason for its toxic action. L. found that food heavily infested with mites caused a fatal haemorrhagic gastro-enteritis when fed to g. pigs, but that the feeding of large amounts of either living or dead mites had no effect upon the animals. It was noted that food which had decomposed to about the same extent as mite-infested samples caused the same symptoms in g. pigs. It is therefore suggested that while the mites themselves are harmless, their presence indicates that decomposition [by moulds ?] has proceeded to an amount which may be undesirable. It was noted that the degree to which the animals were affected depended on the individual rather than upon the amount of infested food eaten.—J. G. CARR.

See also absts. **451** (tsetse fly repellents), **344** (vectors of African horse sickness), **395** (tick pyaemia in lambs).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

*CHAO, L. (1941). **A Survey of the Parasites of Dogs, Cats and Rats made at Chengtu, Szechwan, China.**—*Chin. med. J.* **59.** 550–564. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 487]. **365**

In dogs at Chengtu, C. found the following :– *Clonorchis sinensis, Paragonimus westermanni, Taenia* spp., *Echinococcus granulosis, Diphyllobothrium* sp., *Dipylidium caninum, Sparganum* sp., *Toxocara canis, Ancylostoma caninum, A. brasiliense, Thelazia callipaeda, Dirofilaria immitis,* and *Spirocerca sanguinolenta.* [There is no reference in the German abstract to the cats and rats indicated in the title.]—H. D. CROFTON.

*NIKOLTSHEV, K. (1942). [**Cysticercosis of Swine in Bulgaria**].—*Kühl- u. Schlachthofwesen.* **10.** 3–23. [In Bulgarian]. [Abst. from abst. in *Tierärztl. Rdsch.* **48.** 307]. **366**

Two hundred pigs with cysticercosis were examined, and cysts were found in the following sites :– in the muscles of the neck, chest, loins, and legs in 90% of cases, in the masseter muscles and the diaphragm in 84% of cases, in the tongue in 80%, in the heart in 72%, in the abdominal muscles in 66%, in the intercostal muscles in 58%, in the back muscles in 54%, and in the oesophagus in 10%. Among the other organs infested, it was found that the brain was affected in 52% of cases, and the eye muscles in 32·5%. The occurrence of a cyst in the lens of the eye was recorded.

The macroscopic lesions are described, and N. discusses the results of histological examination.

—H. D. CROFTON.

GAEHTGENS, W. (1943). Serodiagnostische Untersuchungen über Taenieninfektionen, unter besonderer Berücksichtigung der Zystizerkenkrankheit. [**Serodiagnosis of Taeniasis, Especially of Cysticercosis**]. —*Arch. Hyg., Berl.* **129.** 133–157. **367**

Aqueous extracts of *Cysticercus cellulosae* from infested pigs were used in the serological confirmation of seven known human cases of cysticercosis cerebri.

The complement-fixation reaction was found to be of most use, reinforced in some cases by flocculation and precipitin reactions. It was necessary to use strictly critical technique in order to be sure of success in these reactions. Even so, it was found that strongly positive cysticercus antisera gave cross-reactions with the *Echinococcus* antigen in hydatid fluid, and similarly *Echinococcus* antisera from human cases of echinococcosis gave cross-reactions with cysticercus antigen. These cross-reactions occurred more particularly in the case of the complement-fixation reaction, but occasionally in the flocculation reaction as well. It was found possible to eliminate these cross-reactions by absorbing the *Echinococcus* fraction of antibody in a given serum with *Echinococcus* antigen adsorbed on kaolin, or the cysticercus fraction with kaolin-adsorbed cysticercus antigen. This technique was also found useful in eliminating the possibility of nonspecific reactions, particularly in the diagnosis of echinococcosis, where such reactions are liable to raise difficulties.—D. G. G.

PINTO, C., & DE ALMEIDA, J. L. (1939). Equinococose ou hidatidose humana e animal, especialmente no Brasil. **[Animal and Human Echinococcosis, Especially in Brazil]**.—*Rev. Dep. nac. Prod. Anim.* **6.** 1–125. [See also *V. B.* **8.** 710]. **368**

This is a review of the position regarding hydatid disease in Brazil. The condition is most common in the state of Rio Grande do Sul, but is increasing in frequency throughout the country. The authors call for energetic control measures.—MILLER WATSON.

I. SERRES, J. R. (1942). Profilaxis de la hidatidosis equinococósica y su legislación, en la República Argentina. **[Hydatid Disease and its Legal Control in the Argentine]**.—*J. agron. vet., Univ. B. Aires, 1941.* pp. 105–148. **369**

II. SERRES, J. R. (1942). Profilaxis de la hidatidosis. Interpretación de las leyes n° 12.732 y n° 12.733. Lo que las provincias pueden y deben hacer. **[Argentina: Prevention of Hydatid Disease. Interpretation of Laws 12,732 and 12,733]**.—*Rev. Fac. Agron. Vet., B. Aires.* **10.** 148–155. **370**

I. S. reviews the prophylactic measures against hydatid disease taken in the Argentine since 1906. They consist largely of accepted measures such as meat inspection, control of abattoirs, prohibition of unauthorized slaughter, control of dogs, and publicity directed towards educating the public.

II. S. calls for better co-ordination between provincial governments and the central authorities in combating echinococcosis. He details measures which should be taken by all local authorities for the control of slaughter houses and of dogs, and calls for further publicity regarding hydatid disease.—MILLER WATSON.

*HINDERSSON, R. (1942). Trikiner i isbjörnskött. **[Trichinae in Polar Bear Meat]**.—*Suom. Eläinlääkäril.* p. 25. [Abst. from abst. in *Skand. VetTidskr.* **32.** 456 & 457]. **371**

H. found trichinae in a polar bear. He refers to the danger of consuming meat from flesh-eating animals which are not normally subjected to meat inspection.
—H. D. CROFTON.

ROGERS, W. P. (1942). **The Metabolism of Trichinosed Rats during the Intermediate Phases of the Disease.**—*J. Helminth.* **20.** 139–158. [See also *V. B.* **13.** 174]. **372**

The results confirm R.'s previous observations [*V. B.* **13.** 174, abst. 1153.] that protein digestion in rats falls to its lowest level 4–12 days after infection with *Trichinella spiralis*. Diarrhoea and anorexia also occurred during this period. The degree of digestive disorder appeared to be unrelated to the number of larvae finally recovered from the host's tissues. Limited data indicate that (1) inorganic P excretion falls to a low level 4–8 days after infection, followed 24 days later by an increase to 2 or 3 times the normal level, and (2) Ca assimilation falls during the same period after infection and instead of returning and remaining at the normal level falls again about 36 days later.—R. ALLCROFT.

NAGAHATA, S., FUJITA, J., & IKEGAYA, S. (1941). **On the Experimental Haemonchosis of Sheep.**—*Jap. J. vet. Sci.* **3.** 155–190. [In Japanese: English summary]. **373**

The authors carried out extensive experiments on sheep to demonstrate the relationship between the severity of *Haemonchus contortus* infestation and the nutritional state of the animals. Two groups, each containing a ram and two ewes, were given anthelmintic treatment in an attempt to free them of worms. The first group was fed daily on 0·5 kg. wheat bran, 0·2 kg. barley, 1·0 kg. field hay, 20 g. calcium carbonate, and a small quantity of common salt, while the diet of the second group consisted only of 2·0 kg. field hay per day. The animals of this group, in contrast to those of the first group, did not increase their original body weight. After five weeks on the experimental diets, the ram and one ewe in each group were drenched four times on alternate days with about 1,000 *H. contortus* larvae mixed with about 2% of *Strongyloides papillosus* larvae. The remaining ewe in each group served as a control. No large increase of excreted eggs occurred in any of the animals. Some weeks later, each animal received 4,000, and 24 hours later 6,000, *H. contortus* larvae, mixed with 4% of *S. papillosus* larvae, after which a very marked increase was shown in the excretion of eggs by the animals of the second group. Egg counts of the faeces of animals of group I showed only slight infestation. This notable difference in the severity of infestation was confirmed by P.M. examinations. Various tables show the results of numerous haematological and biochemical examinations made on the infested animals and indicating that severe anaemia and malnutrition are the main features of haemonchosis.—E. R. PARISER.

BACIGALUPO, J., POU, M. C., VIERA, O., & MATTO, J. J. (1942). Bronco-neumonia por Aelurostrongylus abstrusus (Railliet 1989) en el Rio de la Plata. [*A. abstrusus* **Infestation of the Lungs of Cats in the Rio de la Plata**].—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** 283–292. **374**

The authors report the occurrence of *A. abstrusus* infestation of a cat which had a persistent cough with debility ending in death. Larvae and eggs were found in the lungs, which were in an advanced stage of bronchopneumonia. Some eosinophile infiltration was noted.
—MILLER WATSON.

CAMPBELL, D. H. (1942). **Experimental Eosinophilia with Keratin from Ascaris suum and other Sources.**—*J. infect. Dis.* **71.** 270–276. **375**

Various fractions of fresh or dried *A. lumbricoides* were tested by intra-abdominal or occasionally intravenous injections into g. pigs, rats, or rabbits for their power of inducing eosinophilia. It is pointed out that to characterize a true eosinophilotactic substance, it should be possible to induce a significant eosinophilia with relatively small amounts of material, in a single injection, otherwise the substance might be eosinophilotactic merely because of its ability to induce a hypersensitive state.

Neither finely ground whole worm material, nor lipoid fractions obtained by ethanol, ether, or benzene extractions, nor water-soluble fractions produced by extraction with saline solutions of varying pH induced any eosinophile response on a single injection. A second

injection of whole worm material or of the aqueous extract 1–2 weeks later produced a marked response, indicating the development of hypersensitivity, but the lipoid fractions, if carefully purified and freed from protein, did not induce hypersensitivity. It was found that the insoluble protein residues left after the previous extractions produced a small response after a single injection, and this response was very much increased when material was used that had been further purified by peptic and tryptic digestion. In larger doses this *Ascaris* keratin produced violent connective tissue reactions. Limited tests were made with similar fractions obtained from *Cysticercus fasciolaris*, *Nippostrongylus muris*, and *Trichinella spiralis*, with similar results. Keratin from sheep wool and from hair of rabbits, rats, and g. pigs, purified by benzene extraction and peptic and tryptic digestion, gave the same marked connective tissue response and eosinophilia, except that g. pig keratin did not produce eosinophilia after one injection into g. pigs. A purified preparation of fibroin from silk did not give eosinophilia after one injection, but did induce hypersensitivity. Heat-coagulated egg albumin behaved similarly.—D. G. Gilmour.

*König, H. (1940). Hautreaktionen mit Spulwurm- und Strongylidenantigen bei Pferden. **[Skin Reactions in Horses to *Parascaris* and *Strongylus* Antigen].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I. (Ref.)*. **141.** 507]. **376**

After tests with *Parascaris* and *Strongylus* antigen [? combined—German abst. not clear] into 74 healthy horses and into 11 foals, K. concluded that a skin reaction may occur after infestation has been lost. The reactions produced did not differentiate between infestations with *Parascaris* and *Strongylus*.—H. D. Crofton.

See also absts. **452**, **453** (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Tannenbaum, A. (1942). **The Genesis and Growth of Tumours. II. Effects of Caloric Restriction per se. III. Effects of a High-Fat Diet.**—*Cancer Res.* **2.** 460–467 & 468–475. [For part I, see *V. B.* **10.** 608]. **377**

II. In a continuation of the studies described in I, it was shown that mice receiving a restricted intake of calories remained in good bodily condition, but developed significantly fewer spontaneous mammary carcinomas than control mice of the same susceptible strain with unrestricted dietary intake. A similar result was obtained with induced carcinomas. In the case of induced sarcomas, the total number appearing was reduced in the restricted group, but the actual rate of tumour growth was not influenced.

It is pointed out that in experimental cancer research, it is important to ensure that some treatment credited with a primary effect is not in fact producing a secondary effect through reduction of dietary intake.

III. Three high-fat diets, which contained 12, 28, and 31% of fat respectively, were compared with diets containing only 2–3% of fat. It is claimed that in mice receiving the high-fat diets, the incidence of spontaneous mammary carcinoma was significantly greater, and that of skin tumour induced by 3,4-benzpyrene significantly less, than in the low-fat groups. No significant differences could be detected in the case of spontaneous lung tumour, or of sarcoma induced by interscapular injection of 3,4-benzpyrene.

—Alastair N. Worden.

Dobberstein, J., & Matthias, D. (1942). Über das Mammacarcinom bei der Hündin. **[Mammary Carcinoma in the Bitch].**—*Arch. wiss. prakt. Tierheilk.* **78.** 18–31. **378**

Mammary tumours are more common in dogs than in other domestic animals. They usually occur in older animals. The frequency of carcinoma is not known, as many of the cases described in the earlier literature were probably benign mixed tumours of the mamma. True carcinoma is responsible for only about 10% of cases. A case is described of adenocarcinoma of the mamma found in an eight-year-old mongrel bitch, with metastases in the lungs.—J. G. Carr.

Gardner, W. U. (1941). **The Effect of Estrogen on the Incidence of Mammary and Pituitary Tumors in Hybrid Mice.**—*Cancer Res.* **1.** 345–358. **379**

The experiments were designed to determine the possibility of an inherited tendency to develop neoplasms. They were made on the hybrids of two strains, one of which was mammary-tumour susceptible and the other, while being resistant to mammary tumours, showed under oestrogen treatment a high incidence of hypophyseal tumours. The incidence of mammary and hypophyseal tumours in both groups after oestrogen injections is described. In the case of the hypophyseal tumours, there was a correlation with genetic factors.

—H. Laser.

Streich, W. (1943). Lymphangioendotheliome beim Schaf. **[Lymphangio-Endothelioma in a Sheep].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 34–36. **380**

A ten-month-old female sheep was slaughtered because of a broken leg. The abdomen was found to contain about 1·5 litres of fluid, and a portion of the duodenum was found to be abnormal. The serosa was thickened, and had numerous small raised processes. No other abnormality was noted in the body. Histological examination of the material indicated that the lesion was of an unusual type, best classified as a lymphangio-endothelioma.—J. G. Carr.

Duran-Reynals, F. (1940). **Production of Degenerative Inflammatory or Neoplastic Effects in the Newborn Rabbit by the Shope Fibroma Virus.**—*Yale J. Biol. Med.* **13.** 99–110. **381**

Subcutaneous injection of extracts of fresh tissue from the Shope fibroma into newborn rabbits produced a local inflammatory lesion, followed by generalized degenerative or proliferative changes in various tissues and organs. Virus recovered from both the local and generalized lesions again induced benign Shope fibromas in adult rabbits. The lesions in newborn rabbits were similar in some respects to those produced by the myxoma virus.

Virus material which had been stored in glycerol and subsequently injected subcutaneously into newborn rabbits produced in some animals a local lesion which often increased in size and brought about generalization of the infection and death: tumour metastases were frequently associated with the walls of blood vessels and appeared to arise from the cells of the adventitia.

—E. G. White.

Duran-Reynals, F. (1940). **Neutralization of Tumor Viruses by the Blood of Normal Fowls of Different Ages.**—*Yale J. Biol. Med.* **13.** 61–76. **382**

D. has previously reported the detection of natural antibodies against many bacteria, viruses, and foreign cells, in the blood of normal adult fowls, and their absence in the blood of chicks. It is now shown that

the blood of adult Plymouth Rock fowls contains a factor which behaves like a natural antibody against the Rous sarcoma virus: similar factors suppressing the activity of the viruses of the Fuginami sarcoma and the Mill Hill 2 endothelioma were also demonstrated. In the case of the Rous sarcoma, the inhibiting factor is rarely present in the chick. A small proportion of adult fowls are highly susceptible to the Rous sarcoma virus and such birds show little or no antibody in the blood, whereas those which are partially or totally resistant show such antibody in amounts which are proportional to the degree of resistance. These observations appear to support the view that natural antibodies may be serological manifestations of growth and ageing rather than the result of subclinical infection. For example, the antibodies may appear very early in the life of the chick and the agents on which they act are not always concerned with commonly occurring natural diseases. Differences in the antibody content of the plasma of adult fowls and chicks should be borne in mind when fowl plasma is used for the cultivation of the viruses of tumours and other disease conditions.

—E. G. White.

Barber, C. W. (1943). **The Effects of Environment on the Incidence of Avian-Leukosis Complex Lesions Among Resistant and Non-Resistant Chickens.**—*Cornell Vet.* **33.** 78–84. **383**

Of the White Leghorn fowls reared at the New York State Veterinary College Poultry Experiment Station, 40–60% have, in past years, developed lesions of the avian leucosis complex.

Two groups of White Leghorn fowls of strains which had been bred for resistance to the avian leucosis complex were obtained. Chicks of these two strains together with chicks of the poultry experiment station were divided into two groups. One group was reared in the environment which had been favourable for the development of a high incidence of the avian leucosis complex. The other group was brooded and reared until five months of age on a farm some distance away where the incidence of the condition in previous years had been low. At five months of age, all the birds were mixed.

The incidence of avian leucosis complex lesions at 500 days of age in the birds of the three strains when reared at the experiment station was 38%, 31%, and 46% respectively, whilst the incidence in the birds reared at the farm was 20%, 20%, and 25% respectively. The size of the groups varied from 35–89 birds.

It is concluded that resistance to the avian leucosis complex depends not on genetic constitution alone but also on environmental factors acting during the rearing period.—F. D. Asplin.

Barber, C. W. (1942). **The Incidence of Neural Lymphomatosis in Cannibalized Chickens.**—*Cornell Vet.* **32.** 450. **384**

A short note on the incidence of neural lymphomatosis in 40 fowls which had died as a result of cannibalism without having shown symptoms of paralysis. It was found that 25% had both gross and microscopic lesions of neurolymphomatosis and a further 15% had microscopic lesions alone.—F. D. Asplin.

Harnden, E. E., & Smith, H. C. (1943). **A Case of Turkey Lymphomatosis.**—*Poult. Sci.* **22.** 331–333. **385**

A note on lymphomatosis in a one-year-old turkey, bred and raised on the premises. It appears that there was a slight possibility of contact with chickens on the premises.—Anthony Buxton.

See also abst. **399** (Shope papilloma).

DISEASES, GENERAL

Hamerton, A. E. (1941). **Report on the Deaths Occurring in the Society's Gardens During the Years 1939-1940.**—*Proc. zool. Soc. Lond.* Ser. B. **111.** 151–185. **386**

For the first time, typical feline infectious enteritis was recorded in a lion cub, which died 48 hours after attacks of vomiting had commenced. A Siberian tiger (*Felis tigris mongolica*) also died from this disease, while the infection was suspected, but could not be established, in a tiger cub. An outbreak of anthrax caused the death of three lions, a cheetah, two Northern lynxes (*Felix lynx*), and a white-nosed coati (*Nasua narica*): a batch of horse meat was suspected of being the source, but a sample obtained was said to be too decomposed for bacteriological examination. An Indian elephant (*Elephas maximas*), about four years old, died very suddenly with an acute haemorrhagic pancreatitis, associated with the presence of nematode worms (*Grammocephalus varedatus*) in the pancreatic ducts. Infestation of the gall bladder and liver with *Ascaris lumbricoides* caused the death of an African bush pig, *Potamochoerus koiropotamus*.

Among primates, the female gorilla, "Moina", died from self-inflicted septic wounds of the feet and hands, with associated gangrene and septicaemia, and there are interesting accounts of two incompletely elucidated deaths in chimpanzees. A third chimpanzee died with fatty and subsequent changes in the cardio-vascular system and liver, attributed to overfeeding, while a fourth succumbed to a primary ventricular haemorrhage, there being no detectable changes in the surrounding cerebral tissue. A rufous stump-tailed monkey (*Macacus rufescens*) died from subacute combined degeneration of the spinal cord, as described in earlier reports. A baby gorilla, "Moko", died from helminthiasis: phenothiazine was found to eliminate *Enterobius* and *Oesophagostomum* infestations, but not hookworms.

Several mammals died, or had to be destroyed, as the result of enemy action. A three-year-old female giraffe was panic-stricken by the explosion of H.E. bombs, and galloped frantically round its paddock for 3½ hours: it died three weeks later and was found to have marked myocardial haemorrhages and a rupture of the inner muscular fibres of the right auricular groove. What is described as probably the rarest fatal accident ever recorded occurred to a tenrec (*Cententes ecaudatus*), the penis of which became firmly knotted upon itself in the middle of the pendulous portion, and caused urethral obstruction, rupture, and peritonitis.

—Alastair N. Worden.

*Derzelle, E. (1942). Un cas de photodermite chez le cheval. [**Dermatitis in a Horse due to Photosensitization**].—*Ann. Méd. vét.* p. 139. [Abst. from abst. in *Skand. VetTidskr.* **32.** 838]. **387**

In mid-September, during sunny weather, a horse at grass became ill. The animal was brown in colour except for a white face. The non-pigmented skin had become oedematous and exuded serum; the eyes were half-closed; the animal was dull and took food reluctantly. The pasture was bare and comprised a white clover with common grasses; green oats had been fed twice daily.

The animal was placed in a box and fed with boiled hay and oats, the affected skin being treated with

astringents. Complete recovery followed in 14 days. —G. B. Brook.

Casella, G. J. (1942). Enorme esteatoma de un caballo. [**A Large Steatoma in a Horse**].—*Rev. Med. vet., B. Aires.* **24.** 433–436. **388**

A large swelling of about eight months' duration on the inner aspect of the upper third of the foreleg of an eight-year-old horse was removed. The tumour weighed about 5 kg. and had the appearance of a steatoma.—J. G. Carr.

Sutherland, A. (1943). **Haematuria in Cattle.**—*Vet. Rec.* **55.** 269–270. **389**

S. describes a variety of conditions with which he found haematuria associated. These were acute nephritis, chronic or suppurative nephritis (pyelonephritis), cystitis, and urethritis. No common factor or causal agent was incriminated and in each case the presence of whole blood in the urine appeared to be a secondary occurrence. Full case records are given. —N. S. Barron.

Popov, P. A. (1937). Km vprosa za prichinite na planinskata khematuriya. [**Cause of Mountain Haematuria** (*Haematuria vesicalis*)].—*Vet. Klin., Sofiya.* **5.** 143–149, 163–174 & 183–188. [In Bulgarian]. [Shorter version of paper abstracted in *V. B.* **8.** 107]. **390**

The condition is observed in varying intensity in various mountainous districts of Bulgaria. Pregnant cows and oxen are especially susceptible. P. made detailed botanical and pharmacological studies in the Smolyan and Elensk districts which are heavily affected. He found that many wild plants in these districts contained very high percentages of phenolates and other substances such as oxalates, silicates, saponins, glucosides etc. which act upon the urinary tract. He suggests that the haematuria is due not to intoxication by any particular plant but to continual irritation by the above substances ; he discusses the mechanism of such intoxication and the formation of pathological lesions in the bladder which lead to chronic haematuria. Various measures are recommended such as improvements in the cultivation of the soil and in the preparation of hay, and instruction of the public. Therapy is also discussed. There is a detailed review of the literature.—A. Moldawsky.

Egehoj, J. (1943). Ätiologie der Lymphozytomatosis (Knut-Volkmann) des Rindes. [**Aetiology of Lymphocytomatosis in Cattle**].—*Dtsch. tierärztl. Wschr./ Tierärztl. Rdsch.* **51/49.** 3–8. **391**

E. attempted to reproduce the symptoms of this disease by means of chronic protein intoxication, which has been suggested as causing the disease by activating a latent virus. Injections of indole into calves were highly toxic and gave no results of any significance. Daily injections of 50–200 ml. skimmed milk intravenously for several weeks produced a swelling of the lymph nodes, but this later subsided. The general picture produced experimentally was that of exhaustion of the erythropoietic system and marked stimulation of the reticulo-endothelial system, with degeneration of the liver and kidneys in the later stages. The appearances were not in any way suggestive of lymphocytoma. These results were not modified by simultaneous injection of streptococcus vaccine, serum of a cow with lymphocytoma, nor extracts of spleen or lymph nodes from animals with the disease. Transplantation of affected lymph node tissue into four untreated calves was also without effect. It is concluded that a virus aetiology is unlikely, and the condition may possibly be an inherited defect.—J. G. Carr.

Cole, H. H., Mead, S. W., & Kleiber, M. (1942). **Bloat in Cattle.**—*Bull. Calif. agric. Exp. Sta.* No. 662. pp. 22. **392**

The total quantity of gas produced in the rumen of dairy cattle was found on an average to amount to 64 litres during the seven hours following feeding when the diet consisted of green alfalfa grass ; this quantity increased to 77 litres when alfalfa hay was fed, while the addition of concentrates to this hay increased the quantity further to 93 litres. No difference between the proportions of the different gases in the rumen was found with these changes of diet, carbon dioxide accounting for approximately 60–70% and methane for 10–25% of the total gas collected. Gas formation was greatest during the hour immediately following the commencement of feeding. The rate at which gas can be removed from the rumen was demonstrated by the fact that it was possible to introduce 150 litres of gas into the rumen in half an hour without serious result to the animal. The introduction of carbon dioxide influenced respirations. The authors put forward the hypothesis that bloat is due to insufficient fibre in the food so that the reflex, whereby belching is initiated, is not stimulated so that gas cannot escape.—A. T. P.

Dougherty, R. W. (1942). **Analyses of Gas and Ingesta of Bloated Cattle.**—*Amer. J. vet. Res.* **3.** 401–402. **393**

The concentration of hydrogen sulphide in the gas and ingesta of the rumen of three animals 12–72 hours after death varied from 0·14–0·70 and from 0·45–0·69 vol. % respectively. Similar concentrations were found in the abomasum of one animal. The pressure of gas in the rumen varied from 72–75 mm. Hg. Histamine was also found and varied in quantity in the rumen ingesta from 0·60–2·45 mg.%. The significance of these results is discussed.—A. T. Phillipson.

Knapp, B., Jr., Baker, A. L., & Phillips, R. W. (1943). **Variations in the Occurrence of Bloat in the Steer Progeny of Beef Bulls.**—*J. Anim. Sci.* **2.** 221–225. **394**

The steer calves of 13 Hereford bulls were observed over a period of two years while on a diet of maize, dried molasses, beet pulp, bran, and linseed meal with alfalfa hay. A significant difference in the numbers of steers affected by bloat was found between the progeny of various bulls in only one of the two years. The number of days, however, on which the animals under observation were bloated showed that during both years the progeny of some bulls were in a bloated condition more frequently than the progeny of others. The conclusion is drawn that the ability of an animal to digest large quantities of roughage is influenced by their genetical heritage.—A. T. Phillipson.

Foggie, A. (1943). **The Prevention of Tick Pyaemia in Lambs with Staphylococcus Toxoid.**—*Vet. Rec.* **55.** 317. **395**

In Ireland, tick pyaemia has long been known among sheep of the Antrim mountains and, during the last six or seven years, has become established on an area of 6–7 sq. miles near Hilltown, Co. Down. In the latter area, the disease appears after ewes and lambs are turned from the arable lambing pastures to tick-infested hills. The incidence of tick pyaemia during 1942 in 166 lambs which were injected with 2·5 ml. staphylococcus toxoid was 4·8% against 8·4% in 166 controls. In 1943, of 99 ewe lambs receiving an intramuscular injection of 2·5 ml. staphylococcus toxoid on April 14th, and again on May 6th, 3% developed tick pyaemia of a mild nature, against 17·6% in 91 ram lamb controls. Treatment of a number of cases with a 5 ml. injection of toxoid gave indeterminate results.—G. B. S. Heath.

DOYLE, L. P. (1943). **Swine Dysentery.**—*J. Amer. vet. med. Ass.* **102.** 449–450. **396**

Swine dysentery is a distinct entity of as yet unknown origin. It can, however, be reproduced by the feeding of gut contents or faeces. *Salmonella suipestifer*, though found in association with outbreaks, is thought to bear the same relationship to this disease as it does to swine fever. Though young pigs are the most susceptible, pigs of all ages are liable to contract the disease; mortality may reach 100%, but 25% is an average. The incubation period in natural outbreaks is four days to 2–3 weeks. Experimentally, however, this period varies from 6–9 days.

In young animals, the faeces usually, though not always, contain fresh blood and mucus, but in older animals the faeces have the usual dark melaena appearance. Animals which recover remain unthrifty and are liable to relapse. The disease is essentially a haemorrhagic catarrhal enteritis involving the caecum and colon. The stomach may show hyperaemia.

—N. S. BARRON.

I. MERTZ, E. T. (1942). **Abnormal Capillary Resistance in Swine Suffering from an Inherited Bleeding Disease.**—*Amer. J. Physiol.* **138.** 136–139. **397**

II. MERTZ, E. T. (1943). **A Blood Vessel Defect in Swine Suffering from an Inherited Bleeding Disease.**—*Ibid.* **139.** 117–122. **398**

I. As measured by the Dalldorf suction method, the capillary resistance of Poland China "bleeder" pigs [see BOGART *et al.* and MERTZ—*V. B.* **12.** 600.] was found to be abnormally low.

II. The whole-blood coagulation time varied from 36–104 min. in "bleeder" pigs as compared with a range of 19–53 min. in normal animals. There were no apparent differences between "bleeder" and normal animals with respect to the nature of the clot and the speed of its retraction. Small whole-blood transfusions into "bleeder" animals did not influence the saline bleeding time, but reduced the coagulation times to within normal limits for some hours. By injecting heparin intravenously into normal pigs, it was found possible to prolong the coagulation time without affecting the saline bleeding time. The injection of adrenaline caused a local reduction in saline bleeding time in white-skinned (Chester White-Poland China) "bleeder" pigs, but not in black-skinned (pure-bred Poland China) "bleeders", and in the former group it was found possible to control surface haemorrhages (*e.g.* from tooth-sockets) by this means.

It is concluded that, whereas the saline bleeding time is an index of the constricting ability of the blood vessels injured in the test, the whole-blood coagulation time measures some other phenomenon. The data are held to be in good agreement with MACFARLANE'S "two-stage" theory of haemostasis [see *V. B.* **14.** abst. 416.]

—ALASTAIR N. WORDEN.

SEALY, W. C. (1941). **The Induction of Liver Necrosis in Rabbits by the Combination of Experimental Hyperthyroidism and Shope Papilloma.**—*Ann. Surg.* **113.** 572–578. **399**

Of 15 domestic rabbits which had developed multiple Shope papillomas as the result of skin inoculation, 12 developed liver damage of varying degree when fed with 128–768 mg. of desiccated thyroid per day. The range of survival times (3–33 days) was similar to that of normal rabbits fed with the same amounts of desiccated thyroid, but there were no liver changes in the latter group. Shope papillomatosis alone did not cause liver damage.

Photomicrographs are shown of two of the liver lesions: in both cases there is extensive central necrosis, a certain amount of cellular infiltration, and very restricted fatty change.—ALASTAIR N. WORDEN.

DAVIDSON, J. L. (1943). **Disturbances in Water and Electrolyte Balance.**—*J. Amer. vet. med. Ass.* **103.** 160–161. **400**

A brief review dealing with vomiting, intestinal obstruction, diarrhoea, fever, burns, infections, and traumatic shock as specific causes of dehydration, and explaining the pathological changes in dehydration and the rationale of parenteral fluid therapy.—A. N. W.

MORGAN, H. V., & WILLIAMSON, D. A. J. (1943). **Jaundice Following Administration of Human Blood Products.**—*Brit. med. J.* June 19th. 750–753. [See also *V. B.* **9.** 870, and **14.** 10, absts. 59 & 60]. **401**

During the period August 1941 to June 1942, 56 patients at two associated hospitals received transfusions of liquid pooled plasma or reconstituted dried human serum. Following the later appearance of jaundice in some cases, 50 of the patients were traced, and nine were found to have developed jaundice in 7–16 weeks after transfusion. The clinical picture closely resembled that of infective hepatitis, but was varied. The age group was older than that usually affected by infective hepatitis, and in most of the cases there was an arteriosclerosis which may have been accompanied by liver change and so predisposed to hepatoxic agents. In only one case was there a history of contact with a possible source of infection. It is concluded that the cases were similar to those reported as following yellow fever and measles inoculation [see *V. B.* **13.** 389.], but it is noted that they had been given large quantities (300–6,400 ml.) of serum or plasma intravenously, compared with small quantities (0·275 ml.) of vaccine given intramuscularly for the yellow fever and measles vaccinations.—A. N. WORDEN.

See also absts. **455**, **456** (agranulocytosis and leucopenia), **457** (ulcerative caecitis).

NUTRITIONAL AND METABOLIC DISORDERS

MCKAY, W. M. (1943). **The Effect of Nutrition on the Development of Tuberculosis.**—*Vet. Rec.* **55.** 329–330. **402**

Two groups of pigs 10–12 weeks old, one fed a very poor and the other a good diet, were infected by mouth with bovine tubercle bacilli five weeks after the commencement of the dietary régime. When the experiment was terminated 11 weeks later, the animals in the well fed group had an average weight of 178 lb. and all were in good condition, while those in the poorly fed group had an average weight of only 86·5 lb. and all showed signs of rickets. P.M. examination revealed evidence of TB. in all the pigs, but the disease was definitely more generalized and more actively progressive in the poorly fed group.—J. LOCHIEL MCGIRR.

EARLE, I. P., ELLIS, N. R., & GREER, C. S. (1943). **Minimum Roughage Requirements of Horses.**—*Army vet. Bull., Wash.* **37.** 95–109. **403**

This is a progress report on two of a series of uncompleted experiments being carried out at the Agricultural Research Station, Beltsville, Md. The first experiment is an attempt to determine the minimum hay requirements of farm work horses receiving a ration of hay and oats. With Timothy hay, low level (0·65 falling to 0·40% of body weight) groups have fully

equalled control animals (receiving a hay allowance of 1% body weight) in endurance and spirit, and have appeared better in general appearance and in coat. Similarly, lucerne hay fed at a level equal to 0·3% body weight appears to have been superior to that at the 1% level.

The second experiment concerns the minimum roughage requirements of idle ponies, and has been complicated by the fact that the original estimate of energy requirements for maintenance was too high. The indications to date are that the minimum hay requirements are no higher than 0·4% of body weight, and are probably lower.—Alastair N. Worden.

Arnold, F. A., Jr. (1942). **The Production of Carious Lesions in the Molar Teeth of Hamsters** (*C. auratus*). —*Publ. Hlth Rep., Wash.* **57.** 1599–1604. **404**

Occasional carious lesions were noted in the molar teeth of Syrian hamsters maintained for experimental work, and a successful attempt was made to reproduce the condition by dietary means.

Young hamsters (initially 35 days of age) were provided with a diet comprising fine or coarse maize meal, or maize starch, 66; whole milk powder, 30; lucerne, 3; NaCl, 1, and carrots or lettuce once weekly. After 90–95 days, a high incidence of carious lesions was found, particularly in those animals receiving fine maize meal or maize starch. Control hamsters receiving a stock diet of commercially prepared food pellets remained free from lesions.

Two types of lesion were observed, and in view of the fact that it was not necessary to feed coarse cereal particles in order to set up the condition, it is suggested that the hamster may prove superior to the rat for experimental work in caries.—Alastair N. Worden.

Sampson, J., & Graham, R. (1943). **Studies on Baby Pig Mortality. III. A Note on Experimental Insulin Hypoglycemia in the Pig.**—*J. Amer. vet. med. Ass.* **102.** 176–179. [For part II, see *V. B.* **12.** 505]. **405**

In preliminary attempts to set up experimental hypoglycaemia, it was found that the individual response to insulin varied, and was not dependent upon body weight within the range of animals employed. Young pigs which had not been previously fasted often showed only a listlessness following two injections of 20–40 units of insulin, but in other cases they developed convulsions and coma, from which they recovered spontaneously or following glucose therapy. Young pigs which had been previously fasted developed a prolonged hypoglycaemia following similar injections of insulin: the hypoglycaemia did not respond satisfactorily to repeated intraperitoneal injections of glucose (20 ml. of a 40% solution) begun eight hours after the insulin, and the animals died with P.M. findings of muscular and connective tissue oedema. In one animal, the blood sugar level returned to normal during severe convulsions.

It is suggested that the failure of animals with "baby pig disease" [see *V. B.* **12.** 505.] to respond to glucose therapy may be due to the same factors as those operating in these experiments. Repeated daily injections of 20–40 ml. of 40% glucose solution caused a marked elevation of the blood sugar level, but no clinical symptoms, in normal piglets.—A. N. Worden.

Holman, R. L. (1942). **Low Protein Diet Augments Hyperproteinemia Produced by Repeated Injections of Homologous Plasma. Evidence for a Dynamic Equilibrium Between Food, Plasma, and Tissue Proteins.**—*J. exp. Med.* **76.** 519–525. **406**

The hyperproteinaemia resulting from repeated intravenous injection into dogs of plasma from homologous donors was greater (average increase of 40% in plasma protein concentration) in animals which were receiving a low protein diet than in those receiving a diet of lean meat (average increase, 20%). The albumin: globulin ratio fell significantly in the low-protein, but not in the high-protein, group. There were no significant changes in body weight nor in plasma non-protein-nitrogen concentration.

These findings are discussed in some detail, and are interpreted as evidence of a dynamical equilibrium between food, plasma, and tissue proteins. It is considered that the "ideal" protein to combat hypoproteinaemia might prove to be a more or less specific substance which controls the above-mentioned equilibrium.—Alastair N. Worden.

Duckworth, J., & Godden, W. (1943). **The Occurrence of Abnormally Low Values for Blood Inorganic Phosphorus and Plasma Phosphatase in Sheep with Concurrent Hypoproteinaemia.**—*Vet. Rec.* **55.** 382. **407**

Blood analyses performed at three-weekly intervals on groups of sheep showed that in all groups, non-rachitic and affected with varying degrees of rickets, a hypoproteinaemia occurred which in some cases was transient but in others persisted for several weeks. This diminution had no relation to the experimental procedure, since it occurred sporadically in every group. Associated with every case of hypoproteinaemia were low values for blood inorganic P and plasma phosphatase; the serum Ca values were uninfluenced. Occasionally abnormally low values for plasma phosphatase were found without concomitant hypoproteinaemia.—R. A.

Boelter, M. D. D., & Greenberg, D. M. (1943). **Effect of Severe Calcium Deficiency on Pregnancy and Lactation in the Rat.**—*J. Nutrit.* **26.** 105–121. **408**

Of a group of 26 mature female rats fed on a low Ca diet containing 10·6 mg. Ca per 100 g. of food, only six gave birth to living young after 48 attempts at mating. Immature female rats on the same diet did not show normal oestrous cycles and failed to mate.

Lactation was found to be a greater strain on the Ca stores of the mother than was pregnancy. The viable young of the Ca-deficient mothers were normal at birth except for low bone ash and bone Ca content. During lactation, the mother was unable to supply sufficient Ca to maintain normal skeletal Ca in the surviving young.—Alfred T. Cowie.

*Schreiber, G. (1941). Versuche zur Ermittlung des Einflusses des 3wertigen Eisens auf die Hodenentwicklung junger Ziegenböcke. [**Influence of Trivalent Iron on Testicular Development of Young Goats**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 292]. **409**

Regular measurement of the testicles of young goats on an adequate diet showed that oral administration of 1·56–2·36 g. daily of trivalent iron in the form of ferrum oxydatum saccharatum had no influence on the testicular development.—E. R. Pariser.

Innes, J. R. M. (1943). **Recent Advances in Connection with Swayback in Lambs, with Allied Disorders in Man and Animals and Experimental Demyelination Diseases.**—*Vet. Rec.* **55.** 369–372. **410**

In this review the more recent information regarding the aetiology and pathology of "swayback" or ataxia is discussed, and the condition is compared with demyelination disorders in man. Most of the material has already been dealt with in previous publications [see Bennetts & Chapman—*V. B.* **8.** 654; Dunlop & Wells—**9.** 492; Dunlop *et al.*—**10.** 612; Innes *et al.*—**11.** 243 & 388].—R. Allcroft.

PATTON, J. W. (1943). **Clinical Aspects of Vitamin B_1 Deficiency in Dogs.**—*Vet. Med.* **38.** 262–264. **411**

Three cases are cited in illustration of P.'s contention that field cases of vitamin B_1 deficiency in the dog often require protracted treatment (with subcutaneous injections of 1,000 I.U. of the vitamin). It is recommended that in severe cases, in which there are periods of marked excitability, a sedative should be given at the same time as the initial injection of vitamin B_1 [see also *V. B.* **11.** 629].—ALASTAIR N. WORDEN.

CALDWELL, F. E., & GYÖRGY, P. (1943). **Effect of Biotin Deficiency on Duration of Infection with *Trypanosoma lewisi* in the Rat.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 116–119. **412**

Groups of young albino rats were kept for varying periods on a biotin-deficient diet, and then inoculated intraperitoneally with *T. lewisi*. Control rats on a normal diet were infected at the same time. Blood examinations for *T. lewisi* were carried out every other day during apparent infection and for six days after the cessation of infection, and showed that groups of rats in which symptoms of biotin deficiency developed had significantly longer infections than the control rats. Rats with latent biotin deficiency without symptoms had longer infections than their controls, but the difference was only slightly significant. In these rats the latent deficiency did not develop into overt deficiency during the period of infection, suggesting that possibly the parasites synthesized biotin, thus preventing the development of deficiency symptoms which would otherwise have occurred. The effect of biotin deficiency in lengthening the infection was shown to be specific, since biotin given to infected deficient rats prevented this effect.—D. G. GILMOUR.

HANDLER, P., & BERNHEIM, F. (1943). **The Effect of Choline Deficiency on the Fat Content of Regenerated Liver.**—*J. biol. Chem.* **148.** 649–654. **413**

In rats which survived partial hepatectomy, liver regeneration proceeded as rapidly in animals receiving a choline-deficient diet as in normally fed controls, but the resultant tissue was markedly fatty. Regeneration was equally good when the diet was deficient in both choline and vitamin B_1, and when growth of the whole animal was retarded by the incorporation of 2% nicotinamide in a choline-deficient diet, but in these cases the fat-content of the liver was slightly subnormal.

—ALASTAIR N. WORDEN.

PATRICK, H., BOUCHER, R. V., DUTCHER, R. A., & KNANDEL, H. C. (1943). **Prevention of Perosis and Dermatitis in Turkey Poults.**—*J. Nutrit.* **26.** 197–204. **414**

The anti-perosis properties are described of biotin, choline, and an unrecognized factor or factors from an aqueous extract of brewers' yeast which can be adsorbed on fuller's earth or norite and subsequently eluted with ammonium hydroxide.

Dermatitis and perosis occurred frequently by the end of the third week in poults receiving a basal ration plus varying levels of riboflavin, whilst a control group of poults receiving 10% dried brewers' yeast developed normally.

Poults receiving rations adequate in biotin, but inadequate in any fraction of the aqueous yeast extract or in riboflavin, were protected from dermatitis but not from perosis. An alcohol-precipitate fraction of the extract alone was ineffective, but a combination of biotin concentrate with either the ammonium hydroxide eluate or the alcohol-precipitate fraction did protect poults from perosis.

Inositol did not influence the incidence of perosis, but choline when fed at a level of 0·2% in addition to 10% dried brewers' yeast gave complete protection.

It therefore appears that at least three organic factors are necessary to protect poults from perosis, *viz*, choline, biotin, and the unrecognized yeast factor or factors.—J. D. BLAXLAND.

TRUM, B. F. (1942). **Grass Intoxication and Tetany.**—*Army vet. Bull., Wash.* **36.** 110–116. **415**

This is an account of a disease affecting lactating cows which have access in the spring to fresh luxuriant pasture. During 1940 and 1941, there were more deaths among cattle from this cause than from all other diseases. T. finds that affected cows are gaunt, nervous, and excitable; they may recover spontaneously or develop tetany. The treatment recommended is to remove affected cattle from the pasture and to feed poor hay and molasses and a loose mineral mixture. Intravenous injections of Ca borogluconate, $CaCl_2$, chloral hydrate, and $MgSO_4$ and glucose have all been used with success. The Ca and P of the blood of two affected cows was found to be slightly below normal.

This disease is almost certainly identical with grass tetany or lactation tetany occurring in Great Britain, New Zealand, and Holland.—G. D. S.

(*See also absts.* **373** (nutrition and haemonchosis), **377** (diet and tumours).

PHYSIOLOGY AND ANATOMY

MACFARLANE, R. G. (1941). **Critical Review: The Mechanism of Haemostasis.**—*Quart. J. Med.* **34.** 1–30. **416**

M. states that it is remarkable to observe that the generally accepted view of the actual way in which bleeding is arrested appears to rely almost entirely on observations made in 1882 by G. HAYEM, who found that the mass which plugged a small incision in the jugular vein of a dog was composed of a mixture of fibrin and platelets. The current conception that spontaneous arrest of any bleeding is brought about by the formation of a blood-clot or of a mass of agglutinated platelets is held to be inadequate, among examples cited being the haemorrhage which occurs in haemophilia (in which the normal number of platelets is present), the normal clotting of blood outside the body from cases of purpura haemorrhagica, and the fatal bleeding which sometimes occurs in telangiectasia, athrombocytopenic purpura and some forms of haemorrhagic jaundice (in all of which platelets are present in normal numbers and there is no delay in clotting-time).

From a detailed consideration of clinical and experimental evidence, M. concludes that the platelets, apart from their role as accelerators of blood coagulation and clot retraction, do not appear to play an important part in haemostasis, that coagulation of the blood, although essential for the maintenance of haemostasis (produced by some other factor) is in itself incapable of arresting even the bleeding from a needle puncture, and that capillaries, in certain areas at any rate, normally contract after injury but dilate subsequently. He proceeds to elaborate a tentative hypothesis of haemostasis, which may be summarised as follows: (1) the first normal reaction to injury is haemorrhage from damaged vessels which have been dilated by the liberation of "H" substance; (2) on disappearance of "H" substance the injured vessels contract, and bleeding ceases; (3) during the period of capillary contraction

the blood which has escaped initially has had time to coagulate in the wound and the clot to retract and becomes firmly attached; (4) in open wounds, haemorrhage is now prevented by the preformed clot, while in small wounds approximation of the edges and drying of the exudate are sufficient to prevent the onset of bleeding and clot formation is unnecessary.

The hypothesis is discussed with reference to various clinical conditions, and it is stated that failure of the mechanism of haemostasis may be due to a loss of capillary contractility (thrombocytopenic purpura, athrombocytic purpura and haemorrhagic telangiectasia), to defective blood-clotting (haemophilia, pseudo-haemophilia, fibrinopenia, some cases of haemorrhagic jaundice, and haemorrhagic disease of the newborn), or to both (some cases of jaundice and haemorrhagic disease of the new born, and certain rare haemorrhagic states).—Alastair N. Worden.

Jordan, H. E., & Robeson, J. M. (1942). **The Production of Lymphoid Nodules in the Bone Marrow of the Domestic Pigeon, Following Splenectomy.**—*Amer. J. Anat.* **71.** 181–205. **417**

The authors carried out splenectomy by cauterization on 16 pigeons, with subsequent examination of the bone marrow, spleen, liver, and rectal caecae. They found that a loss of one-half or more of the spleen was sufficient to cause the production of lymphoid nodules in the bone marrow within a period of three weeks, these attaining maximum size in 5–6 weeks. This was followed by regression of the nodules until they were finally composed of scar tissue, which was coincident with regeneration of splenic tissue. The authors also state that the loss of one-quarter or less of the spleen caused medullary lymphoid hyperplasia and early indications of nodule formation.

In conclusion, they point out that in the squab the spleen is the primary source of lymphocytes and that this function is taken over by the bone marrow in adults with consequent reduction in size of the spleen. Under the experimental conditions of splenectomy in the squab the nodules formed in the bone marrow become the main source of small lymphocytes (*i.e.* "primitive cells").
—Anthony Buxton.

Chiaravalle, A. M., & Aramburu, H. G. (1942). La secreción biliar del equino estudiada por medio de la fistulización del conducto hepático. **[Bile Secretion in Horses Studied with the Aid of a Bile Duct Fistula].**—*Rev. Fac. Agron. Vet., B. Aires.* **9.** 233–253. [English and Portuguese summaries]. **418**

The technique of the operation is given in detail, ten animals being used, and observations on the secretion being carried out for up to 26 days. Secretion continued during fasting, but was increased in amount during digestion. More mucin was present during fasting periods, but the specific gravity was always 1·010. The amount of secretion varied considerably in different individuals, daily outputs ranging from 1,900 ml.–5,904 ml. for 20 hours; the average was about 3,000 ml.—J. G. Carr.

Charton, A., & Minot, G. (1943). Electrocardiogramme normal du cheval. **[The Normal Electrocardiogram of the Horse].**—*C. R. Soc. Biol. Paris.* **137.** 150–152. **419**

Over 200 animals were studied in the course of this work. Lead II was the most interesting. The P wave was doubled, the second wave (P′) being more marked and reaching 1 millivolt; the PP′ complex lasts 0·12–0·14 sec. in most animals. The QRST ventricular complex contains an additional wave R′ following S. Q, R, and S are very variable. R′ is strongly accentuated in overworked or exhausted animals. QRSR′ lasts about 0·12 sec. T is usually biphasic. PQ lasts 0·15–0·18 sec. and is increased with age or fatigue. R′T is much shorter in donkeys.
—J. G. Carr.

Tonnarelli, A. (1941). Rilievi semiotici negli ovini. **[Symptomatology in the Sheep. III. Temperature].**—*Nuova Vet.* **20.** 8–11. [For previous parts, see *V. B.* **14.** 29, abst. 172]. **420**

Temperature varied with that of the environment, the range and average determined on 88 animals being: at an environmental temperature of 5°, 38·3–39·4°, av. 38·9°; at 15°, 38·6–39·5°, av. 39·1°; at 20°, 39·0–39·5°, av. 39·2°; at 25°, 38·9–39·7°, av. 39·2°. Temperature decreased with age, the results for 355 animals being: 1 mth., 39·4–40·2°, av. 39·8°; 1 mth. to 1 yr., 39·2–39·8°, av. 39·5°; 1–7 yrs., 38·8–39·5°, av. 39·1°; over 7 yrs., 38·6–39·1°, av. 38·8°. Sex and pregnancy had no effect, but females in heat, and males with them, showed a small increase. Race and size had no influence. The exercise resulting from pasturing caused a small increase. There was a daily fluctuation of about 0·5° the minimum occurring at 5 a.m., and the maximum at 5–6 p.m.—J. G. Carr.

Homburger, F. (1943). **Influence of Spinal Section on Tissue Permeability.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 258–260. **421**

An investigation into whether or not the nervous system is involved in the regulation of tissue permeability in living animals was carried out on 11 rabbits and one dog by comparing the spread of India ink plus saline and India ink plus spreading factor before and after transection of the spinal cord at levels varying from the first to the fifth thoracic segment. Control animals were laminectomized without spinal cord injury and treated similarly. Marked reduction in the spread was observed in the skin of all spinal animals when India ink was injected both with saline and with spreading factor and occurred in areas above as well as below the level of section of the spinal cord. From these results, it is concluded that the nervous system takes part in the regulation of connective tissue permeability.
—R. Allcroft.

Donald, H. P. (1943). **Heat During Pregnancy in Dairy Cows.**—*Vet. Rec.* **55.** 297–298. **422**

In two herds with good breeding records, D. made a study of those cows which produced normal full-term calves after apparently short gestations. In 849 normal single pregnancies, the gestation periods averaged $281{\cdot}97 \pm 4{\cdot}46$ days. Thirty-six cases were observed in which the gestation period was apparently 267 or fewer days, although normal viable calves were produced. It was thought significant that all these unusually short gestations were associated with at least two services and that calculation of the gestation period from a service prior to the last gave values well within the normal range of variation. Altogether there were 44 matings during pregnancy. Three cows were served three times, two twice, and 31 once, all after conception. These were frequencies of actual mating, amounting to 3·4% of cases, and did not include cases where the cow appeared to be in oestrus but was not, or could not be, served. The interval between conception and subsequent oestrus varied from 15–232 days; oestrus occurred at any time within the first six, most frequently within the first three, months and its appearance seemed to bear no relation to the age or breed of the cow. It occurred in at least 3·4% of cases.

The significance of oestrus during pregnancy in relation to fertility, pregnancy diagnosis, and paternity is discussed.—J. G. Murray.

*Jürgens, F. (1942). Askorbinsäuregehalt mit Sperma fruchtbarer und unfruchtbarer Bullen und Ziegenböcke. **[Ascorbic Acid Content of Semen of Fertile and Infertile Bulls and Goat Bucks].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 393]. **423**

The average ascorbic acid values per ml. for ejaculate, testicular spermatozoa, and spermatozoa from the epididymis of bulls were respectively :– 0·026 mg., 0·052 mg., and 0·092 mg. ; the average values per ml. for the buck were respectively 0·034 mg., 0·056 mg., and 0·078 mg. The values fluctuated from animal to animal and there was no definite relationship between the ascorbic acid values and the number of sperms in the examined material. It was concluded that ascorbic acid determinations alone did not always provide sufficient proof of the sterility of an animal.—E. R. Pariser.

Casida, L. E., Meyer, R. K., McShan, W. H., & Wisnicky, W. (1943). **Effects of Pituitary Gonadotropins on the Ovaries and the Induction of Superfecundity in Cattle.**—*Amer. J. vet. Res.* **4.** 76–94. **424**

A study was made of the effects of pituitary gonadotropins on the reproductive organs of cows and female calves. In most cases, different types of extract of sheep pituitary were used, but in a few cases unfractionated extracts of the pituitaries of other species were used.

The ability of the ovaries to show measurable gross response to treatment with unfractionated sheep pituitary extract appeared to be dependent upon the previous presence of vesicular follicles, but not directly upon their presence. Repeated intravenous injections were much less effective in stimulating ovarian changes than were repeated subcutaneous injections. Comparison between unfractionated ox and sheep pituitary extracts showed the former to be only slightly less effective. Quantitative results appear to be much less predictable than qualitative results. Simultaneous injection of an oestrogen did not appear to enhance or modify the ovary-stimulating action of the gonadotropin.

Treatment of calves with follicle-stimulating fraction combined with subsequent treatment with luteinizing fraction gave rise to the production of ova in some cases, and in some of these fertilization took place.

No evidence was found to suggest that the ovaries of pregnant cows were less sensitive to the action of gonadotropins than were the ovaries of non-pregnant cows. Unfractionated extract did not appear to initiate oestrus. When purified follicle-stimulating fraction was used, four out of nine cows showed accelerated oestrus after administration by the subcutaneous followed by the intravenous routes. Evidence was produced suggesting an apparent difference in the potential fertility of ova produced during the luteal and the follicular phases. Two cows which were submitted to prolonged treatment (35–40 days) with unfractionated pituitary extract showed severe ascites and loss of appetite.—J. G. Murray.

Trentin, J. J., Lewis, A. A., Bergman, A. J., & Turner, C. W. (1943). **Nature of the Pituitary Factor Stimulating Mammary Duct Growth.**—*Endocrinology.* **33.** 67–74. **425**

Lewis & Turner (1939) reported that the mammary duct-growth stimulating factor (mammogen I), said to occur in pregnant cattle pituitaries, was lipid in nature. The method of extraction has now been reinvestigated and it has been found that the duct-stimulating potency is almost entirely in the protein fraction and not in the lipid fraction. Probable sources of error in the original work are discussed and possible explanations presented. The possible identity of this factor with the lobule-alveolar factor (mammogen II) is still to be determined. [See also Lewis & Turner—*V. B.* **10.** 714.]—A. T. C.

Lewis, A. A., & Turner, C. W. (1942). **Effect of Diethylstilbestrol on Mammary Gland Development in Dairy Animals.**—*Endocrinology.* **31.** 520–528. **426**

The effect of diethylstilboestrol and diethylstilboestrol dipropionate on mammary development was studied in 12 goats and one cow. The mammary glands were examined macroscopically and microscopically and compared with the mammary glands from 19 control goats. Both experimental and control groups contained dry and lactating animals, virgin females, and males. The mammary glands of treated virgin female or dry goats were greatly increased in size over those of the controls and in five cases there was normal but incomplete lobule-alveolar development which was well beyond the virgin duct stage, but in no case were the glands comparable to those of normal parturient lactating animals. In three treated goats, the alveolar lobules were only partially developing or in a state of regression. One mature multiparous goat which had a high lactation showed surprisingly little epithelial development. Two male castrate goats and one male kid failed to show mammary development even after high oestrogen dosage. An aged sterile cow with mastitis which was subjected to oestrogen treatment showed well developed lobule-alveolar systems in a healthy quarter as well as in three infected quarters.

—Alfred T. Cowie.

Elftman, A. G. (1943). **The Afferent and Parasympathetic Innervation of the Lungs and Trachea of the Dog.**—*Amer. J. Anat.* **72.** 1–27. **427**

Using the reduced silver technique of Cajal after fixation in chloral hydrate, E. carried out a histological study of the innervation of the trachea and lungs of dogs aged one day to six weeks. The fixative was introduced by perfusion of the trachea, pulmonary artery, or both, followed by immersion in the fixative. The parasympathetic and afferent nerve fibres stain more intensely by this method than do the postganglionic sympathetic fibres. Preganglionic parasympathetic fibres end in pericellular baskets about ganglion cells in the lungs. Efferent fibres to the bronchial musculature and intrapulmonary lymph nodes originate in the intrapulmonary ganglia : they are considered to be postganglionic parasympathetic fibres. The lymph nodes may also receive some sympathetic fibres. The bronchial musculature is provided with afferent nerve endings which differ from the muscle spindles characteristic of striated muscle : similar endings are found in the perichondrium. The pulmonary epithelium is supplied with a variety of different types of nerve endings, illustrated by camera lucida drawings, and these are considered to give rise to the impulses which provoke the pulmonary reflexes. Silver impregnation failed to demonstrate the presence of a perivascular nerve plexus and this is therefore probably of sympathetic origin.—E. G. White.

See also abst. **502** (fat metabolism), **405** (insulin hypoglycaemia in pigs), **392** (ruminant digestion), **503** (autonomic regulations), **463** (bovine fertility), **489**, **490** (bull sperms).

POISONS AND POISONING

Selye, H. (1943). **Production of Nephrosclerosis in the Fowl by Sodium Chloride.**—*J. Amer. vet. med. Ass.* **103.** 140–143. **428**

The effects produced in chicks are described when small doses of NaCl were added to the drinking water of three groups each containing 12 birds. A 2% solution

of NaCl instead of drinking water given to a group of two-day-old chicks killed them all within three days. A 0·9% solution substituted for the drinking water caused a more chronic type of disease in 19-day-old birds. Three of the group died within five days, but some survived up to 20 days. The chief symptoms in the more acute form of poisoning in this group were those of generalized tissue oedema, ascites, pericarditis, and diarrhoea, whilst in the more chronic form there were clinical symptoms and marked renal changes resembling Bright's disease and characterized by nephrosclerosis and disturbances in water metabolism. A 0·3% NaCl solution given instead of drinking water produced no effects on four-week-old chicks over a period of two weeks.

This experimentally produced NaCl intoxication was noticed to bear a striking similarity to the disease known by such names as pullet disease, blue comb disease, and X disease, and the possibility is discussed of accidental NaCl poisoning being associated with this disease.—J. D. BLAXLAND.

RHIAN, M., & MOXON, A. L. (1943). **Chronic Selenium Poisoning in Dogs and its Prevention by Arsenic.**—*J. Pharmacol.* **78.** 249–264. **429**

Of the 34 dogs used in this investigation, 14 were used primarily to study the effect of a seleniferous ration and 20 to determine the effect of As in addition to a seleniferous ration. The basic ration was high in grain as in some cases the Se was supplied as seleniferous grain and in others as added sodium selenite. Toxic symptoms, as shown by subnormal growth and restricted food intake, were caused by as little as 7·2 p.p.m. of Se in the ration in the natural form as seleniferous grain and by 10 p.p.m. as sodium selenite ; 20 p.p.m. as Na_2SeO_3 induced refusal of food and death in a very short time (about 40 days) ; this same amount in the natural form produced severe nervous disorders resembling " blind staggers ". The appearance of the more severely affected dogs resembled that of cattle, horses, and pigs with chronic selenosis.

When 5 p.p.m. arsenic in the form of sodium arsenite was added to the drinking water of dogs on a ration containing as much as 13 p.p.m. Se in the natural form, symptoms of chronic Se poisoning were counteracted or prevented and the dogs appeared more alert and active than the control animals. Dogs on the control ration devoid of Se, when given the same amount of As, showed no toxic effects and at P.M. examination appeared normal in all respects. Addition of As either with or without Se appeared to be conducive to the deposition of subcutaneous and abdominal fat.

The chief pathological changes due to chronic Se poisoning are described. The liver and spleen were the organs mainly affected, the former being atrophied, necrotic, cirrhotic, and highly pigmented in localized areas, while the spleen was enlarged and had localized haemorrhagic areas. Ascites developed in most of the dogs and this condition was always accompanied by a dilation of blood vessels in the kidney region.

Analyses of various body tissues showed that there was no apparent relationship between the Se content of the tissues and the length of time the dogs were fed seleniferous rations. The liver, kidney and spleen contained the greatest amounts of Se, but all the tissues examined contained some Se. The distribution of As was similar to that of Se, but much individual variation in the deposition of both substances was noted. No consistent reduction in Se content of the tissues was observed in dogs fed As with Se. Analyses of numerous blood samples showed that chronic Se poisoning has little or no effect on the commonly determined blood constituents except haemoglobin and possibly non-protein nitrogen and phosphatase activity. The haemoglobin was markedly reduced depending on the severity of poisoning, but administration of As brought about partial recovery from the anaemia and was effective in maintaining the Hb near the normal level.—R. ALLCROFT.

I. BARNES, J. M., & ROSSITER, R. J. (1943). **Toxicity of Tannic Acid.**—*Lancet.* **245.** 218–222. **430**

II. CLARK, E. J., & ROSSITER, R. J. (1943). **Liver Function in Rabbits after Injection of Tannic Acid.**—*Ibid.* 222–223. **431**

I. This work was undertaken in order to investigate the toxic effects resulting from tannic acid absorption from a burned surface. G. pigs burned to the extent of a quarter of their body surface and treated with tannic acid had a higher mortality and a greater loss in weight than similar animals burned to the same extent but not treated with tannic acid. Liver necrosis was more severe in burned animals treated with tannic acid than in burned animals which had not been treated with tannic acid. The authors point out that severe liver necrosis in human cases of burns has only been reported since the introduction of the treatment of burns with tannic acid which strongly suggests that this substance should not be used indiscriminately on large burned areas [see also CAMERON *et al.*—*V. B.* **14.** 34, abst. 207].

II. Impairment of liver function, as measured by the galactose tolerance test was found in rabbits after subcutaneous and intravenous injection of tannic acid. —G. D. S.

TEMPERTON, H. (1943). **The Effects of Feeding Green and Sprouted Potatoes to Laying Pullets.**—*Vet. Rec.* **55.** 359. **432**

The possibility of solanine poisoning from feeding green and sprouted potatoes was investigated. Three groups each of four 18-week-old pullets were used in a feeding trial in which minced green potato leaves and haulm, raw green potato sprouts, and cooked green potato sprouts were fed daily at the rate of 2 oz. per head to each group respectively for a period of 112 days. During this period the birds came into lay and, judged by external appearances, the health of all 12 birds was unaffected by the rations fed.—R. ALLCROFT.

RIETZ, J. H., & MOORE, E. N. (1943). **Red Squill (Raticide) Poisoning in Swine.**—*J. Amer. vet. med. Ass.* **102.** 120–121. **433**

Red squill, used to destroy rats, was scattered about a building where pigs were kept and the unconsumed squill swept up and added to the garbage which was subsequently fed to the pigs. As a result, there were 46 deaths out of 700 pigs kept on the farm. The most prominent P.M. features were broncho-pneumonia and reddening of the mucous membrane of the stomach and intestines.—G. D. S.

EMMEL, M. W. (1943). **The Toxic Principle of Aleurites Fordi Hemsl.**—*J. Amer. vet. med. Ass.* **103.** 162. **434**

On administration of a cold water extract of the leaves of *Aleurites Fordii* (tung oil tree) to mature rabbits, a profuse watery diarrhoea resulted which continued for four days. Over a period of five days after the cessation of the diarrhoea, the animals slowly recovered. A similar result was obtained in chickens after administration of the extract *per os*. The intact leaves, however, readily produced fatal illness when fed to chickens. The extract haemolyses the red cells of chicken and rabbit blood and when boiled with 5% HCl reduces Fehling's solution. From these results and from the fact that the extract is destroyed by heat, E. concludes that the poisonous property of the tung oil tree is due to a saponin.—G. D. S.

Meyer, O. O., & Howard, B. (1943). **Production of Hypoprothrombinemia and Hypocoagulability of the Blood with Salicylates.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 234–237. **435**

The hypoprothrombinaemia resulting from administration of salicylates which was reported by Link *et al.* [see *V. B.* **13.** 371, abst. 2493] is confirmed. Oral administration of daily doses of 1·3–5·3 g. sodium salicylate or acetyl-salicylic acid to human beings resulted in hypoprothrombinaemia and hypocoagulability of the blood. Administration of vitamin K prevented these effects.—R. Allcroft.

See also absts. **487** (lead in bone), **390** (haematuria due to plant poisoning), **364** (toxicity of food mites).

THERAPEUTICS AND DISINFECTION

Stokes, J. L., & Woodward, C. R., Jr. (1943). **Formation of Tyrothricin in Submerged Cultures of Bacillus Brevis.**—*J. Bact.* **46.** 83–88. **436**

Investigations were made on the relation of the nitrogen nutrition of *B. brevis* to tyrothricin formation in stationary and submerged cultures. When aerated submerged cultures containing complex nitrogenous nutrients were used, tyrothricin was not formed, but it was readily formed in both submerged and stationary cultures in a synthetic medium consisting of glucose, inorganic salts, and asparagine. Twelve other amino acids are listed which can be substituted for asparagine. The bactericidal agent was not produced in synthetic media under submerged conditions in the presence of a mixture of 19 amino acids, and it is suggested that the failure of tyrothricin to appear in submerged cultures containing complex nitrogenous substances may be due to one or more of the amino acids of the mixture (or complexes) replacing characteristic amino acids in tyrothricin.—R. Allcroft.

Meyer, K., Hobby, G. L., & Dawson, M. H. (1943). **The Chemotherapeutic Effect of Esters of Penicillin.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 100–104. **437**

Further work on the *in vivo* chemotherapeutic effect of esters of penicillin is reported [see also *V. B.* **13.** 404, abst. 2723]. 1·5 mg. or more of ethyl ester administered subcutaneously protected mice infected with 100–10,000 L.D. of haemolytic streptococci; 0·6 mg. gave little protection. Also one single subcutaneous injection of 2 mg. given ½ hour after infection gave complete protection against 1,000 L.D. of haemolytic streptococci. Similar results were obtained with the *n*-butyl ester. When the esters were administered orally, it was found that the required therapeutic dose was about ten times greater than the necessary subcutaneous dose because absorption from the stomach is less regular. The toxicity of the ethyl and *n*-butyl esters of penicillin is 2–3 times that of penicillin, but when given subcutaneously the toxic range is far above the therapeutic range. The *in vivo* activity of these esters in contrast to their *in vitro* inactivity is apparently due to their slow hydrolysis in the body with the liberation of active penicillin.—R. Allcroft.

Turner, J. C., Heath, F. K., & Magasanik, B. (1943). **Inhibition of Urease by Penicillin. [Correspondence].**—*Nature, Lond.* **152.** 326. **438**

In an attempt to discover easily measurable properties of penicillin for assay purposes, it was found that even highly purified preparations of the substance will inhibit the activity of urease. It is suggested that this property of penicillin may be connected with the peculiar elevation of blood urea observed in some cases (human) under treatment with the drug.—R. Allcroft.

Chain, E., Florey, H. W., Jennings, M. A., & Williams, T. I. (1943). **Helvolic Acid, an Antibiotic Produced by *Aspergillus fumigatus, mut. helvola* Yuill.**—*Brit. J. exp. Path.* **24.** 108–119. **439**

The method of isolation in a pure crystalline state and the chemical and biological properties are described of an antibacterial substance named "helvolic acid". It is obtained from the culture filtrate of *A. fumigatus*, mut. *helvola* and has the elementary composition $C_{32}H_{44}O_8$. Helvolic acid in general inhibits the growth of Gram-positive organisms, including the gas gangrene group, but is almost inactive against Gram-negative organisms except the meningococcus and *Salmonella enteritidis*; this range of activity is very similar to that of penicillin. The dilution at which it inhibits growth depends on the number of organisms present in the inoculum; its action is predominantly bacteriostatic. Toxicity and pharmacological tests showed that it is relatively non-toxic to leucocytes and tissue cultures, and amounts well below the lethal dose ensured a high antibacterial titre in the blood of mice and a cat; it is readily absorbed from the gut, subcutaneous tissues, and peritoneal cavity and excreted in the urine and bile. Histological observations showed that repeated administration of helvolic acid causes damage to the liver. Protection experiments with mice infected with a virulent staphylococcus and a streptococcus showed that life was prolonged, but survival was not obtained, by administration of helvolic acid.—R. Allcroft.

McIlwain, H. (1943). **The Anti-streptococcal Action of Iodinin. Naphthaquinones and Anthraquinones as its Main Natural Antagonists.**—*Biochem. J.* **37.** 265–271. **440**

A pigment from *Chromobacterium iodinum* named "iodinin", which is the di-*N*-oxide of a dihydroxyphenazine, inhibits the growth of a number of pathogenic bacteria [see *V. B.* **12.** 309]. Concentrations of $1·2–2 \times 10^{-6}$ *M* completely inhibited the growth of *Streptococcus haemolyticus* which was used as the test organism. The inhibition by this pigment was relatively little affected by a variety of natural products including microbial extracts and plant and meat extracts; a few interfered with its action probably because they contained anthraquinone and naphthaquinone derivatives. The manner of the antagonistic action of the quinones was investigated and it is suggested that because of the structural similarity between the *N*-oxides and quinones, the two classes of compounds may function at common sites in the organism and that the action of iodinin may be to inhibit systems normally concerned with such quinones.—R. Allcroft.

Armstrong, W. D., Spink, W. W., & Kahnke, J. (1943). **Antibacterial Effects of Quinones.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 230–234. **441**

The *in vitro* antibacterial effects of several quinones are reported on a molecular and on a weight basis against a pathogenic strain of staphylococcus and of streptococcus. Substitution in the quinoid ring reduced the antibacterial activity of the substances. Comparison with sulphathiazole and phenol under the same experimental conditions showed that these substances were less than one-tenth as effective as the most potent of the quinones against staphylococci, while comparison with an impure sample of penicillin showed that penicillin was 13–18 times as effective on a weight basis. —R. Allcroft.

Robinson, E. J., & Crossley, M. L. (1943). **The Metabolism of N^1-Acylsulfanilamides in the Dog.**—*Arch. Biochem.* **1.** 415–423. **442**

Recent research has led to the synthesis of a series of N^1-acyl derivatives of sulphanilamide of the type $NH_2.C_6H_4.SO_2.NH.CO.R$, where R represents an alkyl group of 1–11 carbon atoms. Single doses of such compounds were administered to dogs at the rate of 0·5 or 10 g. per kg. body weight. N^1-acetylsulphanilamide was excreted unchanged in the urine following oral administration, but N^1-butyrylsulphanilamide and higher homologues were excreted largely as sulphanilamide and partly (15% in the case of the N^1-butyryl derivative) unchanged. No breakdown products of N^1-butyrylsulphanilamide were found in the gastric or intestinal contents of dogs which were sacrificed 3–4 hours after oral dosage, but following intravenous administration the compound was excreted largely as sulphanilamide.

In an attempt to locate the actual site of breakdown of N^1-butyrylsulphanilamide in the animal body, the compound was incubated with various rabbit tissues at pH 7·2 at 25°C. Considerable hydrolysis was found to take place with liver and kidney, and a lesser amount with spleen, but none with heart, skeletal muscle, intestinal muscle, or erythrocytes.—A. N. Worden.

Lee, S. W., & Foley, E. J. (1943). **Effect of Temperature on Bacteriostatic Action of Sulfathiazole and Other Drugs. 1.** *Escherichia coli.—Proc. Soc. exp. Biol., N.Y.* **53.** 243–245. **443**

Lee, S. W., Epstein, J. A., & Foley, E. J. (1943). **Temperature and the Bacteriostatic Action of Sulfathiazole and Other Drugs. II.** *Streptococcus pyogenes.—Ibid.* 245–247. **444**

I. The effect of temperature on the bacteriostatic action of sulphathiazole, *p*-aminobenzoic acid, and urea, separately and in several combinations was studied on *Bacterium coli*. It was found that the growth inhibition increased with increase in temperature for all the substances and that *p*-aminobenzoic acid inhibited growth at temperatures above 37°C.; at these elevated temperatures it is incapable of showing marked anti-sulphonamide action.

II. Similar studies using the same drugs as in I were made on *Str. pyogenes* and the results paralleled those obtained with *Bact. coli*. It is considered that the sulphonamide-like action of *p*-aminobenzoic acid at higher temperatures is of particular significance. Urea showed no synergistic action with sulphathiazole on this organism.—J. M. Robson.

Harris, J. S., & Kohn, H. I. (1943). **Factors Influencing the Development of Resistance in Escherichia Coli to the Sulfonamides.—***J. Immunol.* **46.** 189–194. **445**

A method is described which permits any change in the resistance of an organism to sulphonamides to be assigned either to a change in the bacterium or to a change in the environment in which the measurement of resistance is made. The application of this analysis to strains of *Bacterium coli* trained to grow in media containing sulphanilamide showed that the resistance of the bacterium not only depends upon the medium in which training occurred but also upon the medium in which the measure of resistance is made. It was also found that the development of resistance to sulphanilamide does not always parallel that to sulphathiazole. It would thus appear that the action of these two drugs, though similar, is not identical.—J. M. Robson.

Saz, A. K., Johnston, F. R., Burger, A., & Bernheim, F. (1943). **Effect of Aromatic Iodine Compounds on the Tubercle Bacillus.—***Amer. Rev. Tuberc.* **48.** 40–50. [Spanish discussion]. **446**

In view of previous encouraging results relating to the action of iodine-substituted benzoic acid derivatives in inhibiting the growth of tubercle bacilli *in vitro* [see *V. B.* **12.** 270.], the chemotherapeutic potentialities of 16 iodine-substituted aromatic compounds were investigated. The results of *in vitro* growth and metabolism experiments, toxicity tests in g. pigs, distribution and excretion tests in rabbits, and preliminary anti-TB. chemotherapeutic experiments, indicate that 1-diethylamino 2-(2,4,6-triiodophenoxy) ethane.HCl and 2,3,5 triiodobenzoic acid have potentialities warranting a therapeutic trial in selected cases of human TB.

A rapid 12-day g. pig test for the preliminary assessment of the anti-TB. chemotherapeutic efficiency of new compounds is described, the method being based on the observations of a number of workers [*e.g.* Woodruff & Kelly—*V. B.* **11.** 492.] that the intraperitoneal injection of virulent tubercle bacilli into g. pigs results in the rapid appearance of tubercles on the omentum. The authors suggest that the omental weight might be used, under well controlled conditions, as an index of the efficacy of chemotherapeutic agents.

—J. Lochiel McGirr.

Bankowski, R. A. (1943). **A Trial of Sulfaguanidine and Sulfathiazole in the Treatment of Acute Pullorum Disease in Turkeys.—***Cornell Vet.* **33.** 312–314. **447**

A flock of 90 turkeys 3½ months old, with *Salmonella pullorum* infection, was divided into three equal groups, one remaining untreated and serving as controls and the other two receiving sulphaguanidine and sulphathiazole respectively, each bird being given an initial dose of 0·5 g. of the drug and subsequently fed a mash containing 2% of the sulphonamide for seven days. The two drugs were quite ineffective as therapeutic agents.

The concentrations of the drugs in the blood were unexpectedly low and the levels of sulphathiazole were much lower than those of sulphaguanidine, although the rate of food consumption was thought to have been the same in each group.—J. D. Blaxland.

Boughton, D. C., & Davis, L. R. (1943). **An Experiment with Sulfaguanidine in the Treatment of Naturally Acquired Bovine Coccidiosis.—***Amer. J. vet. Res.* **4.** 150–154. **448**

Six pairs of calves with naturally acquired infections of coccidia were placed under conditions conducive to the production of severe infection. Sulphaguanidine was given to one calf of each pair at the rate of 30 g. every second week until 150–180 g. had been administered. The drug was given in 5 g. doses twice daily for three days. It was found that the infections of the treated calves were less severe than those of the untreated controls and that fewer oocysts were discharged. Two untreated calves succumbed to coccidiosis. It is concluded that sulphaguanidine is effective in reducing the severity of bovine coccidiosis in heavily infected quarters.—C. Horton Smith.

Kelsey, F. E., Oldham, F. K., & Geiling, E. M. K. (1943). **Studies on Antimalarial Drugs. The Distribution of Quinine in the Tissues of the Fowl.—***J. Pharmacol.* **78.** 314–319. [See also *V. B.* **13.** 441, abst. 2958]. **449**

The distribution of quinine in the blood and tissues of normal fowls was studied after oral and intravenous administration. Great individual variations, probably due to differences in rate of absorption from the gut, were observed both in blood and tissue levels as regards the peak of concentration and the time at which it occurred after oral administration; the variations were not so great after intravenous administration. No accumulation in the tissues was observed and practically all the quinine had disappeared 24 hours after the last dose. Distribution of the drug was essentially the same after either oral or intravenous administration and

highest concentrations were found in the liver, spleen, adrenals, pancreas, and white blood cells, and lesser concentrations in the bone marrow, lung, heart, testis, and kidney, while the brain, spinal cord, skin, depot fat, and blood contained relatively little.—R. ALLCROFT.

JIŘINA, K. (1943). Beitrag zur Therapie der Kaninchenspirochaetosis. **[Treatment of Rabbit Syphilis].** —*Wien. tierärztl. Mschr.* **30.** 134–135. **450**

Pointing out the lack of information as to the dosage of neosalvarsan suitable for use in rabbits, and the variation in the recommendations of authors for its use in rabbit spirochaetosis, J. records that he used doses of 0·3 g. for rabbits weighing 2 kg., 0·45 g. for those weighing 4 kg. and 0·5 g. for those weighing 5 kg., the drug being given intravenously. Some depression occurred, but no symptoms of poisoning were observed. Deaths ceased immediately, and lesions usually healed within ten days. In cases where the lesions had not healed in ten days, treatment was repeated. 100% of cures are claimed.—U. F. RICHARDSON.

HORNBY, H. E., & FRENCH, M. H. (1943). **Introduction to the Study of Tsetse-Fly Repellents in the Field of Veterinary Science.**—*Trans. R. Soc. trop. Med. Hyg.* **37.** 41–54. **451**

The substances tested for their repellent action on *Glossina morsitans* were pure inorganic reagents, aliphatic compounds, aromatic compounds, oils, extracts, miscellaneous substances, and mixtures. Of the aliphatic compounds, carbon disulphide was appreciably repellent when applied to animals indoors, but failed when they were exposed to sunlight.

Nicotine sulphate had a good repellent and killing action on tsetse, but was extremely toxic when applied to the whole animal.

None of the oils tried, including fish oil and citronella oil gave satisfactory results, nor did extract of derris. Sodium arsenite had no influence on the repellency of substances to which it was added.

A 2% extract of pyrethrum powder suspended in soapy water, and other preparations of pyrethrum, showed considerable repellent action. It is claimed that pyrethrum can be applied to any animal without danger, and that tsetse will probably not feed on the treated animal within the next 24 hours, if it remains in subdued light. In the case of zebu cattle so treated and exposed to sunlight, tsetse will feed within 24 hours, but in the case of donkeys complete protection can be obtained for 24 hours, and some protection up to 72 hours. In a field trial, lasting over seven days, it was noted that treated donkeys were apparently undisturbed by fly, although untreated controls were worried by tsetse.

Details of the experimental technique used are given. Tsetse were starved for four days before use in tests on repellents, the animals under experiment being brought indoors for the feeding. Results were judged on whether flies fed on the treated animals, although it is admitted that probing without feeding may transmit trypanosomes.

A preparation of Kenya oleoresin with a known pyrethrin content, used in a 1 : 1,000 emulsion was shown to be trypanocidal when added to shed blood, and another pyrethrum preparation inoculated intramuscularly into a cow caused no serious reaction, though it failed to show appreciable trypanocidal action. —U. F. RICHARDSON.

GORDON, W. E. (1941). **Phenothiazine for the Anthelmintic Treatment of Swine.**—*Agric. News Letter, Dupont.* **9.** 47–49. **452**

This general statement gives no account of original work.

SHULTS, N. G. (1940). Opyt izucheniya terapii askaridozov krupnykh khishchnikov moskovskovo zooparka. **[Experimental Study of the Treatment of Ascariasis of Large Carnivora of the Moscow Zoological Park. (Preliminary Communication)].**—*Proc. Moscow Zool. Park.* **1.** 247–259. [Abst. from English summary]. **453**

Santonin was chosen as the principal anthelmintic in experiments on the removal of ascarids from 44 large carnivores, including pumas, lions, leopards, tigers, brown bears, polar bears, wolves, lynx, and wildcats. The dose recommended for adult lions is 1–2 g., which was 80–100% efficient in freeing the animals from ascarids. For tigers, doses of 0·5–0·75 g. were sufficient. A puma proved refractory to dosing with 0·3 g. santonin and 0·2–0·3 g. calomel, and the results were unsatisfactory. Two wildcats were freed of ascarids by doses 0·25 g. santonin and calomel. One brown bear was partially, and another completely, freed of worms by doses of 3-6 g. santonin. 4–5 g. was given to each of eight polar bears; complete expulsion of ascarids occurred in two of them, the largest number to be eliminated after one dose being 178.

Constant reinfection occurred in all animals, indicating the necessity of concurrent hygienic measures.

Doses of 5–31 g. santonin, given to brown bears, produced no toxic effects.

HAMILTON, C. M. (1943). **Treatment of Infectious Coryza in Chickens with Sulfathiazole.**—*J. Amer. vet. med. Ass.* **103.** 144–146. **454**

The results are given of the treatment with varying doses of sulphathiazole of a small number of birds affected with infectious coryza. Administration of 5–6 g. at the rate of 1 g. morning and afternoon for three days resulted in a marked improvement of clinical symptoms. Doses of 7 g. at the rate of 1·5 g. morning and afternoon and 0·5 g. at noon for two days brought about recovery, unless the bird was in an advanced stage of the disease. 1 g. per 30 g. of mash fed for three days produced recovery in two out of three birds, but the success of this method of administration depended on the severity of the symptoms and whether or not the birds were feeding normally.—J. D. B.

I. SPICER, S. S., DAFT, F. S., SEBRELL, W. H., & ASHBURN, L. L. (1942). **Prevention and Treatment of Agranulocytosis and Leukopenia in Rats Given Sulfanilylguanidine or Succinyl Sulfathiazole in Purified Diets.**—*Publ. Hlth Rep., Wash.* **57.** 1559–1566. **455**

II. KORNBERG, A., DAFT, F. S., & SEBRELL, W. H. (1943). **Production and Treatment of Granulocytopenia and Anemia in Rats Fed Sulfonamides in Purified Diets.**—*Science.* **98.** 20–22. **456**

I. When 1% of sulphaguanidine or sulphasuccidine was added to a synthetic diet (comprising glucose, casein, cod liver oil, wesson oil, salt mixture, and vitamins B_1, B_6, riboflavin, nicotinic acid, calcium pantothenate and choline), young rats so fed grew badly and developed agranulocytosis, leucopenia, and a hypocellularity of the bone marrow. These changes could for the most part be prevented or cured by the further addition to the diet of 10% of whole dried liver or of liver extracts.

II. In a continuation of earlier studies [see I] the effects of sulphathiazole, sulphadiazine and sulphanilamide were studied. With techniques similar to those employed in the earlier work, a blood dyscrasia (severe granulocytopenia, severe anaemia, or both) was produced in 28 out of 34 rats receiving 1% sulphathiazole, in 22 out of 36 receiving sulphadiazine, and in 2 out of 35 receiving sulphanilamide. Less severe degrees of

granulocytopenia or of anaemia were frequently observed. Treatment with certain liver fractions (*e.g.*, 0·25 g. per day of "Wilson's solubilised liver" extract) corrected the granulocytopenia in four days and the anaemia in about ten days, despite continued feeding of 1% sulphonamide.—ALASTAIR N. WORDEN.

BLOOMFIELD, A. L. (1943). **Elimination of Ulcerative Cecitis from a Rat Colony by Chemotherapy of Mothers.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 197. **457**

Over a period of nine months, many stock animals from the Stanford University rat colony were killed and examined for the presence of ulcerative caecitis [see also *V. B.* **13.** 434, and **14.** 17], and it was found that an average of 55% of rats 4–8 months old had the disease. Inclusion of 0·5% sulphaguanidine in the stock ration of breeding females during pregnancy and lactation reduced the incidence of the disease among the offspring to an average of 4·5% in 4–8 months old rats. This treatment of mothers during pregnancy and lactation largely eliminated the disease from the colony without the need for treating all animals.—D. G. G.

HARDY, J. D., DUERSCHNER, D. R., & MUSCHENHEIM, C. (1943). **Hypothermia in Experimental Infections. I. Preliminary Observations on Tolerance of Guinea Pigs and Rabbits to Induced Hypothermia.**—*J. infect. Dis.* **72.** 179–182. **458**

DUERSCHNER, D. R., MUSCHENHEIM, C., & HARDY, J. D. (1943). **Hypothermia in Experimental Infections. II. The Effect of Hypothermia on Tuberculin Sensitivity in Guinea Pigs.**—*Ibid.* 183–186. **459**

MUSCHENHEIM, C., DUERSCHNER, D. R., HARDY, J. D., & STOLL, A. M. (1943). **Hypothermia in Experimental Infections. III. The Effect of Hypothermia on Resistance to Experimental Pneumococcus Infection.**—*Ibid.* 187–196. **460**

I. The authors cite instances of experimental hypothermia of 10°–15°C. below normal in human beings, for the experimental treatment of cancer, and also in hibernating and non-hibernating animals. Earlier recorded results have been conflicting, probably because the hypothermia was only slight and of short duration, but usually an increased susceptibility to various experimental infections, such as typhus and trypanosomiasis has been shown in individuals submitted to this treatment.

A method is described of producing hypothermia of 8°–10°C. in which temperature recording, and control of as many as ten animals simultaneously can be carried out, the animals being under the influence of barbiturates. Animals are fastened on their sides on a tray which is placed in a refrigerator. An electrically recording thermometer is permanently left in the rectum of each animal. It was found that rabbits could be kept with relative safety at a temperature of 31°–33°C. for 96 hours. G. pigs tolerated a temperature of 31°–33°C. for 24 hours, but further chilling killed all of eight g. pigs within 96 hours. The 24-hour periods could be repeated without ill-effects twice weekly for 10–12 weeks.

II. Sixty g. pigs of 300–500 g. body weight were infected by the subcutaneous inoculation of virulent human type tubercle bacilli (0·1 mg. of a suspension from a three weeks' culture of H37).

The animals were divided into three groups of 20 each. Group A was subjected to a course of hypothermic treatment at 31°–33°C. for 24 hours twice weekly for six weeks, as described in I, group B served as a control group kept under standard conditions, and group C received sodium phenobarbital, as did group A, but was not subjected to chilling in the refrigerator.

After six weeks, all surviving animals were maintained under standard conditions until they succumbed to the infection. Intracutaneous tuberculin tests were made at the third, fifth, seventh and 13 weeks after infection, 1·0 mg. old tuberculin being used at the third and fifth weeks and 0·1 mg. at the other tests. At the third week there were few definite reactions in any group. At the fifth and seventh weeks, reactions in group A were much less intense than in groups B and C. (In group A the tests were made when the body temperature was normal, *i.e.*, between the hypothermic exposures.) At the 13th week, surviving animals in groups A, B, and C all gave similar, well marked reactions.

P.M. examinations revealed neither a retardation nor an acceleration of the progress of infection in the animals of group A, although there had been retardation in the development of skin sensitiveness.

III. Fourteen rabbits were inoculated intradermally with 0·2–0·3 ml. of varying dilutions of an 18-hour broth culture of a highly virulent strain of type I pneumococcus. Seven animals were exposed to experimental hypothermia at 31°–33°C., as described in I. In these, a decrease in the local inflammatory reaction was observed, as compared with the seven controls. Fatal bacteraemia occurred in both groups.

Using a relatively avirulent type III strain of the pneumococcus for intradermal inoculation, the authors found that induced hypothermia inhibited the local skin inflammatory reaction, but resulted in overwhelming bacteraemia and death. A few of the controls (nine of 22) which were anaesthetized, but not exposed to chilling, also developed fatal bacteraemia, probably because of the initial lowering of the temperature by the anaesthesia.

On intravenous inoculation of 0·2 ml. undiluted culture of a type III strain, hypothemia produced bacteraemia and death, whereas the two controls survived.

Local chilling by an ice-cap at the site of intradermal inoculation of 0·2 ml. undiluted culture of type III strain resulted in inhibition of the skin reaction, but failed to cause a fatal bacteraemia, unless the general body temperature was also allowed to fall to a low level. —R. R. A. COOMBS.

SMITH, W., & WILSON, A. (1943). **Effect on the Uterus of Extracts of Gorse (Ulex gallii).**—*Brit. med. J.* Sept. 11th. 322–324. **461**

In parts of Yorkshire and Derbyshire, infusion of gorse is a traditional remedy for retained placenta in the cow. An active extract has now been isolated and partially purified which possesses oxytocic properties. The effect has been demonstrated on the isolated uteri of several species, including pregnant women near full term. Uterine reactivity to gorse extract appears to be increased by oestrogen sensitization.—J. M. ROBSON.

SOSKIN, S., & TAUBENHAUS, M. (1943). **Sodium Succinate as an Antidote for Barbiturate Poisoning and in the Control of the Duration of Barbiturate Anesthesia. (Including Its Successful Use in a Case of Barbiturate Poisoning in a Human).**—*J. Pharmacol.* **78.** 49–55. **462**

It is shown that sodium succinate was an effective antidote in barbiturate poisoning in rats which had received 8·5 mg. of sodium pentobarbital (nembutal) per 100 g. body weight intraperitoneally as an 8·5% aqueous solution. Intravenous injection of the succinate is most effective after the barbiturate has been given, but if given prophylactically before the barbiturate it may be injected intramuscularly or intravenously. It was also found that the duration of both nembutal and sodium amytal anaesthesia in rats could be shortened

by administration of sodium succinate, the degree of shortening depending on the dose given. Preliminary tests showed that succinate had no effect on the anaesthesia induced by non-barbiturates such as tribromethanol or avertin. In a small number of tests on normal dogs anaesthetized with nembutal, the effects observed in rats were not obtained when comparable doses of succinate were used. Glucose, sodium lactate, and sodium malate did not produce effects similar to those of succinate in rats.—R. Allcroft.

Asdell, S. A., Fincher, M. G., Smith, S. E., & Elliott, F. I. (1942). **A Controlled Attempt to Restore Fertility in Dairy Cattle by Treatment with Gonadic and Gonadotropic Hormones.**—*Mem. Cornell agric. Exp. Sta.* No. 243. pp. 27. **463**

An investigation is described to determine whether treatment with oestradiol benzoate, and in a smaller number of cases, sheep pituitary extract would influence the conception rate of sterile cows whose ovaries were, for the most part, functioning apparently normally.

Twenty-seven cows were placed in the treated group and 18 in the control; those cows in the control group which had failed to conceive after six months were then treated. 50% of the control cows became pregnant without treatment, while, of the 27 treated animals, 44·4% became pregnant. Of the former control and subsequently treated cows, 37·5% became pregnant.

It appeared that treatments with oestradiol benzoate and sheep pituitary extract had been of no value. The fact that 50% of cows regarded as sterile recovered spontaneously in six months stresses the importance of controlling adequately all experiments aimed at discovering the efficacy of any treatment for infertile animals.

P.M. examination of those animals which failed to become pregnant revealed pathological changes in the uterus in most cases.

Estimation of the pH of the vaginal secretions showed that in only one out of 32 determinations in six sterile cows was the pH below 7·0 and in that case the acidity was very slight (6·9); the average pH was 8·3. Out of ten isolated observations from nine other sterile cows, the reaction was acid in only one animal, which was affected with pyometra.

The hemoglobin, glucose, calcium, inorganic phosphorus, lipid phosphorus, and cholesterol in the blood of the sterile cows were found to be within the normal range of variation.—J. G. Murray.

Chamorro, A. (1943). Existe-t-il, dans l'hypophyse des animaux soumis à un traitement oestrogène, une hormone spécifique stimulant la mamelle ? [**Investigations on the Existence in the Pituitary of Oestrone-Treated Animals of a Hormone Stimulating the Mammary Gland**].—*C. R. Soc. Biol. Paris.* **137.** 147–150. **464**

Contrary to some other workers [see Gomez & Turner—*V. B.* **8.** 256.], C. finds that oestrogen treatment reduces the capacity of the pituitary of rats to stimulate the development of the mammary gland.

—J. G. Carr.

Pulvertaft, R. J. V. (1943). **Local Therapy of War Wounds. I. With Penicillin.**—*Lancet.* **245.** 341–346. **465**

Pulvertaft, R. J. V., & Mackenzie, D. H. (1943). **Local Therapy of War Wounds. II. With Sulphasuxidine.**—*Ibid.* 379–384. **466**

I. A number of cases of infected war wounds has been treated with the calcium or sodium salt of penicillin, applied as a powder, as a spray, or as a wet dressing covered with soft paraffin gauze. The therapeutic results were excellent. Within 24 hours of application there was a uniform and almost complete drop in the number of Gram-positive organisms, including clostridia, staphylococci, streptococci, and corynebacteria. Gram-negative organisms were not affected. The solid drug was introduced into a cerebral abscess cavity without deleterious effect.

II. In applying sulphonamides in powder form to large absorbing surfaces (*e.g.*, burns, wounds, peritoneum), there is a danger of producing an excessive concentration of the drug in the blood. The more soluble sulphonamides are therefore unsuitable for this purpose. Plasma and other wound fluids break down succinyl sulphathiazole into free sulphathiazole, but the rate of breakdown is so slow that there is no risk of sulphathiazole being absorbed into the blood in dangerous quantities. Local application of a lanoline cream containing 20% succinyl sulphathiazole quickly controlled wound infection by Gram-positive organisms. No toxic or irritant effects were observed and the blood contained less than 1 mg.% of sulphathiazole.—J. M. Robson.

Mitchell, G. A. G., & Buttle, G. A. H. (1943). **Diflavine in Wound Therapy.**—*Lancet.* **245.** 287–289. **467**

Diflavine (2 : 7-diaminoacridine hydrochloride) and proflavine (2 : 8-diaminoacridine sulphate) were found to be less toxic in rats than 5-aminoacridine hydrochloride. Only the first two compounds were used in man, in the treatment of infected wounds of various severity. Beneficial results were produced in almost every case. The drugs were used either in powder form or as solutions in glycerin. The impression was gained that diflavine was not quite as effective as proflavine. Both compounds were found to be active *in vitro* against streptococci, staphylococci, and clostridia.

—J. M. Robson.

Ungar, J., & Robinson, F. A. (1943). **Aminoacridine Antiseptics. Comparison of 2 : 7-Diaminoacridine, 5-Aminoacridine and Proflavine.**—*Lancet.* **245.** 285–286. **468**

Experiments *in vitro* indicate that 2 : 7 diaminoacridine hydrochloride exerts its bacteriostatic action very rapidly. It has a relatively high solubility and its toxicity, as determined by the tissue culture method, is low. Experiments in animals show that on injection into subcutaneous tissues the compound is less damaging than proflavine or acriflavine, while in powder form it interferes less with wound healing. The same is true, to a less extent, of 5-aminoacridine which has the added advantage of being non-staining.—J. M. Robson.

Epstein, A. K., Harris, B. R., & Katzman, M. (1943). **Relationship of Bactericidal Potency to Length of Fatty Acid Radical of Certain Quaternary Ammonium Derivatives.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 238–241. **469**

The effect on the bactericidal value of changing the fatty acid radical of certain quaternary ammonium cationic compounds was studied, *Staphylococcus aureus* and *Salmonella typhi* being used as test organisms. The bactericidal value of the homologous compounds was determined by the official U.S. Food and Drug Administration method and by the method of Welch & Brewer [see *V. B.* **12.** 557]. It was found that in varying the fatty acids from C_8 to C_{18} respectively, the optimum bactericidal activity was obtained when the compound contained the fatty acid radical of C_{14} and the sequence of diminishing bactericidal power was as follows :– $C_{14}>C_{12}>C_{16}>C_{18}>C_{10}>C_8$. When the R radical was varied by substituting three lower molecular weight

groups on the pentavalent N there was little relative difference in bactericidal potency of the compounds.
—R. ALLCROFT.

COOK, E. S., & KREKE, C. W. (1943). **Effects of Yeast Extracts and Phenylmercuric Nitrate on Yeast Respiration and Growth.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 222–225. **470**

The results of respiration measurements demonstrate that an aqueous-alcoholic yeast extract will protect bakers' yeast from the toxic effect of a germicide such as phenyl-mercuric nitrate. After the respiration rate had fallen to zero, the yeast cells were found to be still viable. These observations indicate the importance of respiratory depression in the mechanism of phenylmercuric nitrate toxicity. [See also COOK *et al.*—*V. B.* **12.** 615.]—R. ALLCROFT.

EDWARD, D. G. FF., & LIDWELL, O. M. (1943). **Studies on Air-Borne Virus Infections. III. The Killing of Aerial Suspensions of Influenza Virus by Hypochlorous Acid.**—*J. Hyg., Camb.* **43.** 196–200. [For previous parts, see *V. B.* **13.** 243 & 229]. **471**

Suitable apparatus for the infection of mice with virus particles suspended in the air was described in the first part of this series. Using these methods, the authors examined the effect of hypochlorite mists on the survival of influenza A virus. In some instances, the mist prepared by atomizing a slightly alkaline solution of sodium hypochlorite was added, in known concentrations, to the virus aerosol for varying periods. The amount of living virus which remained was determined by exposing mice to the mist or by collecting in broth a measured amount of the mixture and inoculating mice intranasally with serial dilutions. The difference in the severity of the lesions in the treated mice, as compared with controls receiving virus only, suggested a 90% kill of the virus.

In view of the controversy over the mode of action of hypochlorite mists, the effect of dried hypochlorous acid gas was studied. In four experiments out of five, the effectivity of the gas appeared to have been at least 99%. An initial concentration of 1 vol. of gas to 800,000 vol. of air, giving a final concentration after the reaction of mist and virus of $1 : 2 \times 10^6$ vol. was needed to produce this effect. Such concentrations failed to give observable toxic effects in mice and rats, although acute irritation of the mucous membranes was noted.—R. E. GLOVER.

See also abst. **324** (treatment of fowl spirochaetosis).

HYGIENE AND PUBLIC HEALTH

I. —. (1943). **Report of the Committee on Dairy Farm Methods, International Association of Milk Sanitarians, 1942.**—*J. Milk. Technol.* **6.** 89–100. **472**

II. —. (1943). **Emergency Sanitation Standards for Raw Milk for Pasteurization.**—*Ibid.* 101–119. **473**

I. The standards laid down are those approved by the U.S. Public Health Service Sanitary Advisory Board in 1942. They are very comprehensive and deal with everything relating to milk production, including the construction and sanitation of byres and dairies and attention to be given to the cow. Recommendations, which are of the usual nature, are made with regard to TB. and mastitis.

II. The proper sterilization of the milking machine and utensils is dealt with, with particular reference to the control of the themoduric organisms likely to resist pasteurization. There is reference, on conventional lines, to the common diseases of dairy cattle.—N. S. BARRON.

JENSEN, L. B. (1942). **Microbiology of Meats.** pp. xi +252. Champaign, Ill.: The Garrard Press. [8vo]. **474**

The book is divided into 12 chapters dealing with the history of meat operations; the effects of sodium nitrate on bacteria in meat; gaseous fermentation in meat products by the genus *Bacillus*; the bacteriology of green discolorations on meats; the action of micro-organisms on fats; the bacteriology of normal tissues of swine *ante-* and *post-mortem*; the microbiology of beef; the bacteriology of sausage meat; the microbiology of bacon; the control of micro-organisms; the bacteriology of spices, salt, sugar, paper, and wood; food poisoning of bacterial origin.

DOLMAN, C. E. (1942). **Staphylococcus Enterotoxin.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 363–368. **475**

The procedures adopted by STONE and by CHAPMAN and his co-workers [see *V. B.* **10.** 733.] for the differentiation of toxigenic strains of staphylococci are critically discussed. It is suggested that for the control of staphylococcal food poisoning, more rigid attention to the hygiene of food handling may be profitably adopted, together with more general use of refrigeration. An outbreak of staphylococcal food poisoning involving 34 persons is described with comments on how it could have been prevented. An investigation is also described of 299 faecal samples (sent for bacteriological examination) from 193 people, of which 33 (from 21 individuals) showed the presence of haemolytic staphylococci. Five of these 33 strains were shown by the kitten test to be enterotoxigenic.—D. L. ROBARTS.

See also absts. **366** (swine cysticerci in Bulgaria), **368-370** (echinococcosis in Brazil and Argentina).

TECHNIQUE AND APPARATUS

MCCREADY, R. M., OWENS, H. S., & MACLAY, W. D. (1943). **The Use of Fibrous Sodium Pectate as a Substitute for Agar in Bacteriological Gels.**—*Science.* **97.** 428. **476**

Nutrient gels prepared with sodium calcium pectate have been proved satisfactory for culturing many species of bacteria. Fibrous sodium pectate is added to nutrient broth in a concentration of 2·5%, plus 2 mg. of calcium ion per gramme of pectate. The medium is sterilized in the usual manner, but certain points regarding its melting point and viscosity have to be taken into account.—J. KEPPIE.

BRODIE, J., & STIVEN, D. (1942). **Reclamation of Used Agar.**—*J. Hyg., Camb.* **42.** 498–499. **477**

A detailed description is given of a method, employed successfully for almost a year, of reclaiming agar from all types of used selective agar media except tellurite agar. The procedure was repeated many times with the same used agar without apparent detriment. Bacteria such as meningococci, gonococci and pneumococci grew well, on media prepared from reclaimed agar without the addition of a percentage of new agar.
—R. O. MUIR.

EDWARDS, O. F. (1942). **A Method for the Reclamation of Agar.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 84. **478**

An alternate freezing and thawing technique is

described for the easy and satisfactory reclamation of agar from relatively small quantities of blood agar and plain nutrient agar. The procedure can be adapted for the reclamation of agar from dye media by dialysing in running water and boiling with animal charcoal. Preliminary comparisons, by parallel plate count determinations, of nutrient agar prepared from dried agar and reclaimed in this way, with standard Difco nutrient agar have shown no significant difference.—R. O. MUIR.

FERRAZ, C. C. (1943). Ensaios sôbre a gelatinização de sôro sanguíneo de equino adicionado de caldo simples de carne. **[Preparation of a Solid Horse-Serum Broth Medium].**—*Rev. Med. vet., Lisboa.* **38.** 108–112. **479**

It was found that one part of broth to four parts of serum, heated in a water bath at 68°–70°C. for three hours, provided a reasonably transparent solid culture medium.

JOHNSTONE, K. I. (1943). **A Simple Technique for the Cultivation of Organisms from Single Cells.**—*J. Path. Bact.* **55.** 159–163. **480**

Dilute culture is spread over a thin layer of agar on an ordinary microscope slide which is incubated inside a sterile petri dish. Single, isolated organisms can be identified by means of a 4 mm. objective after one hour's incubation at 37°C. The position of single cells on the slide is noted on the vernier of the moving-stage, and also by means of an electrically heated platinum inoculating needle which is used to melt the agar in their vicinity.

The construction of the platinum needle is described; its tip consists of fine platinum wire which is heat sterilized when a 4 volt current is passed through it for 1 sec. When the single cells have developed into colonies, the latter can be subcultured by means of the platinum needle while being directly observed with the 16 mm. objective.—J. KEPPIE.

I. STRUGGER, S. (1942). Neues über die Fluoreszenzfärbung toter und lebender Bakterien. 1. Zur Theorie der Bakterienfärbung. 2. Ein neues Verfahren zur mikroskopischen Unterscheidung lebender und toter Bakterienzellen. **[Fluorescence Staining of Dead and Live Bacteria. 1. The Theory of Bacterial Staining. 2. A New Method of Microscopic Differentiation between Live and Dead Bacterial Cells].**—*Dtsch. tierärztl. Wschr.* **50.** 51–53. Discussion pp. 85–86. **481**

II. STRUGGER, S. (1942). Ein neues Verfahren zur Färbung von Bakterien. **[A New Staining Method for Bacteria].**—*Berl. Münch. tierärztl. Wschr.* Aug. 21st. 253–255. **482**

These articles describe a method of distinguishing between living and dead bacteria by the use of the dye, acridine-orange; I deals mainly with the development and theory of the method and II largely with the practical details.

Acridine-orange is a basic dye, the fluorescent properties of which are exhibited by the cation. When highly dissociated, 1 : 100,000–1 : 5,000 concentrations of the dye fluoresce green in ultra-violet light, while 1 : 500–1 : 100 concentrations fluoresce copper-red. In living protoplasm, adsorption of the fluorescent cation from solutions of the dye is slight, and a green fluorescence is given; when the protoplasm dies or is killed, denaturing of its proteins leads to an increased adsorption of dye cations, with a resultant copper-red fluoressence. When certain bacteria (*Sarcina lutea, Bacillus bombycis, Erysipelothrix rhusiopathiae*) were tested, such differences of fluorescence were found to occur between living and dead organisms. Details of the method are given.

The full value of the method has still to be determined, but it is likely to prove useful as a rapid method of determining the make-up of a bacterial culture, and of studying the reactions of bacteria to various physical and chemical agents.—E. COTCHIN.

GRAY, P. H. H. (1943). **Two-Stain Method for Direct Bacteria Count.**—*J. Milk Technol.* **6.** 76. **483**

The stain consists of (a) 1% aqueous methylene blue and methyl alcohol, equal parts, and (b) 1% aqueous basic fuchsin and methyl alcohol, equal parts. These are mixed in a proportion of two of (a) to one of (b) and used to stain films of bacteria or milk, the latter being previously defatted. This stain shows up capsules very clearly and differentiates the bacteria from the background.—N. S. BARRON.

HALLINAN, F. J. (1943). **Pyrex Suspensions in Turbidimetric and Colorimetric Determinations. Standards of Comparison for Bacterial Suspensions and in the Resazurin Test.**—*Amer. J. publ. Hlth.* **33.** 137–140. **484**

Fine suspensions of particles of Pyrex glass are shown to possess many advantages over barium sulphate in the preparation of turbidimetric and colorimetric standards. The glass suspensions can be made to resemble bacteria in their particle size, they settle very slowly, and remain stable longer than those of barium sulphate. Chips of discarded Pyrex glass are violently agitated in a Pyrex bottle in a shaking machine which operates with a 2″ stroke at 130 cycles per min. The shaking is continued for many hours with frequent renewals of distilled water. Suspensions of varying particle size are obtained by differential sedimentation. The turbidity of suspensions is determined in a photo-electric colorimeter. A coloured diluent resembling broth may be prepared as follows :– dissolve 1·245 g. potassium chloroplatinate and 1 g. cobalt chloride in distilled water; add 100 ml. of concentrated HCl and dilute to 1 litre. Other diluents, and the preparation of standards for the reazurin test for milk are given. Various uses of Pyrex suspensions in chemical titrations are suggested.—J. KEPPIE.

REED, G. B., & ORR, J. H. (1943). **Cultivation of Anaerobes and Oxidation-Reduction Potentials.**—*J. Bact.* **45.** 309–320. **485**

The reported data agree with the principle that a favourable oxidation-reduction potential is essential for the proliferation of an organism. For the growth of some 15 species of pathogenic clostridia in a simple peptone solution, it was shown that the optimum Eh was in the region of –0·2 volt. A low concentration (0·2%) of reducing sugars such as glucose will slowly bring a slightly alkaline peptone solution to approximately this optimum Eh (–0·1 volt.), but such a medium is poorly poised and a slight admixture of air will cause a pronounced positive drift in the potential. When used in conjunction with low concentrations of agar (0·1%), diffusion of air is reduced and a more stable potential results. The addition of low concentrations (0·1%) of more actively reducing substances such as sodium thioglycollate, cysteine, ascorbic acid, and sodium formaldehyde sulphoxalate, produce better poised oxidation-reduction potentials nearer the optimum for pathogenic clostridia than is produced by addition of glucose; the further addition of agar as well gives a well poised negative potential suitable for growth and multiplication of much smaller inocula than can be obtained with glucose and agar.—J. KEPPIE.

BRAY, W. E., & CARTER, J. S. (1943). **A New Dish for the Single Plate Method of Culturing Anaerobes and Bacteria Requiring Increased Carbon Dioxide Tension.**—*Amer. J. clin. Path.* **13.** 31–34. **486**

This special petri-dish can be used in providing conditions of anaerobiosis, reduced oxygen tension, or increased carbon dioxide tension during the incubation of single plate-cultures in the ordinary incubator. The bottom of the lower half of the dish contains two compartments separated by a ridge. A petri dish of 100 mm. diameter is inoculated, inverted, and fitted to the lower half which contains the appropriate chemicals. The join between the upper and lower halves is sealed with a strip of Parafilm. The dish is tilted to allow the chemicals to mix, and is then incubated.—J. KEPPIE.

FAIRHALL, L. T. (1943). **The Identification and Localization of Lead in Bone Tissue.**—*Publ. Hlth Rep., Wash.* **58.** 209–216. **487**

A method is described for the identification of lead in bone tissue, consisting of deposition of the lead as lead chromate crystals, after decalcification of the bone, by immersion for several days in a 1% potassium chromate + 5% acetic acid solution. Unstained sections are then examined under a polarizing or crystallographic microscope, when the lead chromate deposit is thrown into brilliant relief against the background. This method is quite specific for Pb as other metal chromates are either soluble in acetic acid or can be differentiated easily from crystalline lead chromate.

A study of bone sections from dogs, rats, and g. pigs given Pb over various periods of time showed that the cancellous tissue was rich in Pb as might be expected, but Pb was also always demonstrable in the compact tissue; the cartilage was always found to be free from Pb. Chemical analyses of the shaft and ends of long bones showed that average values for the diaphyses did not differ greatly from those of the epiphyses although it is pointed out that, as the epiphysis contains more water than the shaft, a distinction should be made with reference to the basis of comparison. Also when the calcium-lead ratios are compared, the epiphyseal values are generally greater than the diaphyseal. Deposition of Pb in the red marrow, particularly within the fat cells, was observed in all cases of extensive Pb absorption, but chemical analysis and microscopic examination showed that the yellow marrow was practically free from Pb. It appears that deposition of Pb begins in the fat cells even before it is appreciably deposited in the cancellous tissue. Observations made at different stages of Pb absorption indicated that Pb storage in bone tissue occurs first as a colloidal dispersion, and that later there is a distinct segregation of the Pb into crystalline masses localized in clumps around the Haversian and Volkmann canals, in the compact tissue, in the fat cells of the red marrow, and throughout the cancellous tissue.

Comparison of the bones of Pb-poisoned animals by means of X-rays and by the method described, showed that the small amounts of Pb deposited in bones are insufficient to be revealed by ordinary X-ray photography.—R. ALLCROFT.

LINDSAY, S. (1943). **An Instrument for Removing the Spinal Cord through the Foramen Magnum.**—*Arch. Path.* **35.** 750–751. **488**

This instrument, for use at P.M. examinations of human beings, consists of a V-shaped blade on the end of a spring steel shaft. The apex of the V is soldered and riveted to the shaft. The blades are at an angle of 25° to the shaft and at an angle of 45° to each other. The outer ends and edges of the V are rounded and dull so as not to cut the cord or impinge on the bony walls of the vertebral canal.

The vertebral column is straightened and slight tension placed on the spinal cord, the instrument is then pushed along the vertebral canal within the subarachnoid space, with the concave surface of the blades facing the convex lateral surface of the cord. As the instrument passes along the canal the motor and sensory nerve roots and the dentate ligament are gathered into the V-shaped recess formed by the blades and severed by their sharpened inner edges. The cauda equina is cut after exposure of the canal through one of the inter-vertebral discs and the cord is removed by gentle traction through the foramen magnum.—D. L. H.

BLOM, E. (1943). **A New and Uncomplicated Method for the Staining of Bull Sperms.**—*Skand. VetTidskr.* **33.** 428–431. [In English]. **489**

The semen sample is diluted with 1% NaCl solution so that the mixture contains about 200,000 sperms per cu.mm. A drop of diluted semen is placed on a slide, spread out, dried in air, and fixed by alcohol or heat. Any NaCl in the preparation is removed by washing with distilled water. The staining solution consists of one part 1% sodium carbonate solution mixed with nine parts 1% methyl violet solution. This stain, which must be prepared immediately before use, is poured on to the still moist preparation and left for 5 min. The stain is poured off and the preparation washed vigorously in distilled water for 10–15 sec., blotted, and dried in air; it may be mounted, if desired, with Canada balsam. The method is claimed to give excellent results and is simpler than the classical method of WILLIAMS.—N. J. SCORGIE.

BECK, G. H., & SALISBURY, G. W. (1943). **Rapid Methods for Estimating the Quality of Bull Semen.**—*J. Dairy Sci.* **26.** 483–494. **490**

The viability of spermatozoa at temperatures higher than body temperature and the rate at which the semen will reduce a dilute solution of methylene blue are suggested as a combined rapid test of the quality of bull semen, which may be employed in large-scale field artificial-insemination work. The decrease in motility of bull sperm diluted with yolk-citrate and stored for ten days at 5°C. was shown to be positively and significantly correlated with the decrease in motility for similar samples kept in waterbaths for one hour at 46·5°C., for 45 min. at 47·0°C. and for 30 min. at 47·5°C. Under standard conditions, the rate at which methylene blue was reduced was shown to be largely dependent upon the concentration of spermatozoa, the motility of the spermatozoa, and the concentration of ascorbic acid in the semen.—N. J. SCORGIE.

See also absts. **301** (culture of *Past. tularensis*), **315** (identification of *Cl. welchii*), **321** (oocyst counts in chicken faeces), **333** (production of foot and mouth disease antiserum), **339** (cultivation of rabies virus).

MISCELLANEOUS

KEARNEY, W. (1943). **Veterinary Science and its Part in Agricultural Prosperity.**—*Vet. Rec.* **55.** 46–49. **491**

K. covers the early history of the various attempts to establish a veterinary institute in Dublin between 1800 and the year 1900, when the Dublin Veterinary college was opened. Details are given of the present standard of veterinary training and the modern scope of the work of veterinary graduates.

The application of veterinary science to the development of Eire is discussed. It is emphasized that serious losses occur from preventable animal diseases and statistics are quoted to show the estimated financial loss involved.

The suggestion is made that a contributory scheme by animal owners would provide funds for both research and the control of preventable diseases.—J. A. G.

—. (1943). **The Veterinary Profession and the War. Procedure of Processing Physicians, Dentists and Veterinarians in the Field.**—*J. Amer. vet. med. Ass.* **102.** 422–426. **492**

This gives the complete official memorandum detailing the procedure to be followed in the call-up of physicians, dentists, and veterinarians for war service in the United States Army. The 1943 programme includes the call-up of 900 members of the veterinary profession.—J. A. Griffiths.

—. (1943). **Committee on Animal Health of National Research Council Selected.**—*J. Amer. vet. med. Ass.* **102.** 144–145. **493**

An announcement that the Division of Biology and Agriculture, National Research Council, U.S.A., has appointed a Committee of Animal Health, consisting of G. H. Hart, R. M. Bethke, J. G. Hardenbergh, C. C. Hastings, H. W. Jakeman, and W. E. Petersen.

Hodgkins, J. R., Ragheb, M., Abdou, H. I., & Nashed, M. (1943). **Euthanasia of Equines (The Action of Magnesium).**—*Vet. Rec.* **55.** 269. **494**

The authors describe the technique used for the painless slaughter of over 100 equine animals by the intravenous injection of magnesium sulphate.

Dosage was estimated at 0·5 ml. of an 80% solution of magnesium sulphate per lb. body weight. The solution is injected at body temperature as it is liable to crystallize out if cooled. It was found that the optimum time for injection was 2 min. 30 sec.; more rapid injection resulted in defensive movements. The time taken for the loss of various reflexes and for death varied widely with the size and condition of the animal. In all cases the heart action failed before the respiration. Underdoses resulted in temporary loss of consciousness followed by complete recovery.—R. M. Arnold.

—. (1943). **Liver: The Versatile Organ Supreme.**—*J. Amer. vet. med. Ass.* **103.** 103–104. **495**

This is an abstract of a hitherto unpublished portion of a paper [see *V. B.* **13.** 394, abst. 2651] by L. D. Frederick, and contains no original facts. The nutritional value of liver is emphasized, and tables are shown giving the amino-acid content of the liver and the numbers and types of condemnations of beef livers by Federal meat inspectors from 1935–41.—A. N. Worden.

Orum, A. M., & Lightcap, G. C. (1940). **The Veterinary Research Institute [Iowa].**—*Vet. Student, Iowa.* **2.** 106–109 & 142. **496**

A brief account of the Institute, with some details of the past and present staff.

Gruebler, R., & Cirnejo, M. (1943). **Veterinary Medicine in Chile. Bachelor's Degree a Prerequisite to Five-year Veterinary Course.**—*Vet. Student, Iowa.* **5.** 160–161 & 203. **497**

The first veterinary school was opened in 1890. The course lasted for two years for the diploma of army veterinary sergeant. About 1906, the course was extended and graduates became second lieutenants. The Department of Agriculture took over from the army in 1917, and in 1925 the University of Chile established a Veterinary Department in the School of Agriculture and a bachelor's degree was given after a four-years' course. In 1937, a separate School of veterinary medicine was opened; the degree course now extends over five years, and candidates may take a doctorate 1½ years after graduation.

There are only about 200 veterinarians in Chile. Many of these are in the State services, the army, the police, or the Department of Agriculture, while others are in private practice, but also hold part-time posts on stock farms or with companies possessing large numbers of work animals.

The greatest losses are said to be due to tuberculosis, brucellosis and foot and mouth disease.—J. A. G.

McKenney, F. D. (1943). **Wartime Problems of Zoological Gardens.**—*J. Amer. vet. med. Ass.* **102.** 190–192. **498**

Reference is made to food shortages, precautions taken against the escape of dangerous animals, and difficulties in replacing certain exhibits.—A. N. Worden.

REPORTS

Basutoland. (1942). **[Report of] Veterinary and Livestock Division [1941-42].** [Henderson, G. T.] —*Rep. Dep. Agric. Basutoland, 1941–42.* pp. 10–13. **499**

The general livestock position showed steady improvement, although weather conditions were unsatisfactory and mortality was therefore higher than in the previous year. Only two cattle died of Anthrax. Many outbreaks of Blackleg were dealt with by inoculation of the in-contact animals. There were very few outbreaks of Blue Tongue in sheep and mortality was low. Only a few farmers used preventive inoculation. The compulsory monthly dosing of sheep and goats for Helminthiasis could be carried out for seven months only; the stock in certain areas was found to suffer some reverses as a result of the suspension of the dosing. Outbreaks of Equine Mange were dealt with in some districts.

No census of livestock could be carried out. Details are given of the Division's work in connexion with wool classification and other activities. Exports of animal products consist of 8½ million lb. of wool, 1½ million lb. of mohair, 27,241 hides, 20,365 skins, and 4½ million lb. of bones. 23,369 sheep and goats, 2,225 cattle, and 899 horses were castrated. The revenue was £3,128 and expenditure £14,469.—J. A. G.

Falkland Islands. (1941). **Annual Report of the Department of Agriculture for the Year Ending 30th June, 1941.** pp. 6. Items of veterinary interest pp. 2–3. [fcp]. **500**

There is no veterinarian on the staff of the Department. The weather was favourable for livestock and the lamb crop was well above the average. Livestock returns in June 1940 show 605,359 sheep, 9,765 cattle, and 3,382 horses. 13,088 sheep were exported for "freezing in Chile for export" and 60·5% of these were accepted. Of the 39·5% rejected, 26% were rejected because of poor condition, 3·3% had caseous lymphadenitis, and 1·8% pleurisy and peritonitis.

In the control of Bovine Tuberculosis, the stock inspector carried out intradermal tests with tuberculin. Six of 86 animals tested reacted and were destroyed. In a test of another 169 animals, there were no reactors. As a result of these tests the town of Stanley was declared a TB.-free area. In tests on 120 cows carried out at seven stations, there were four reactors. No cases of Contagious Mastitis were observed.

Caseous Lymphadenitis is common; 6–10% of sheep examined were found to be infected. Other diseases and infestations mentioned are:– Ringworm in cattle, Osteoporosis in a colt, Lice on calves, and Tapeworms and *Haemonchus contortus* in the intestine, and tapeworm cysts in the mesenteries, of sheep. The Sheep Ked is fairly common on some stations.—J. A. G.

BOOK REVIEWS

HUDDLESON, I. F. [D.V.M., M.S., Ph.D., Research Professor in Bacteriology, Michigan State College], HARDY, A. V. [M.S., M.D., Dr.P.H., Associate Professor of Epidemiology, DeLamar Institute of Public Health, Columbia University], DEBONO, J. E. [M.D., M.R.C.P., Professor of Pharmacology and Therapeutics, Royal University of Malta], & GILTNER, W. [D.V.M., M.S., Dr.P.H., Dean of Veterinary Division and Professor of Bacteriology, Michigan State College]. (1943). **Brucellosis in Man and Animals.** pp. xix+379. 42 figs. 1 appendix. New York: The Commonwealth Fund. London: Humphrey Milford, Oxford University Press. [Revised Edit.] [$3.50] [8vo]. **501**

The new edition of this well known work contains some revisions and some additions, while following closely the lines adopted in the original volume. The text is increased by 32 pages. Additions include a more extensive description of dissociation, a description of the determination of virulence by estimation of catalase activity, and the preparation of potato-infusion agar, while the already extensive bibliography is considerably enlarged. The author, in maintaining this review of the brucellosis problem, incurs the indebtedness of a large number of workers.—S. J. GILBERT.

SMEDLEY-MACLEAN, I. [M.A., D.Sc., F.I.C., Biochemical Department of the Lister Institute of Preventive Medicine]. (1943). **The Metabolism of Fat.** pp. vi +104. London: Methuen & Co., Ltd. [8vo] [5s.] **502**

The subject of fat metabolism, although it has been less studied than many other aspects of nutrition and biochemistry, covers a wide range of investigations. The fact, therefore, that this monograph contains little more than one hundred pages determines its nature. The author has not overburdened the small book with irrelevant facts, but has drawn upon her great experience of the subject to select and marshall such experimental results as will help to elucidate the probable course of the main incidents of fat metabolism. Lucidity, together with critical power, has produced a narrative which is both readable and balanced and is thus admirably suited to the needs of students, those who are not well acquainted with the subject, and specialists in allied subjects who wish to keep abreast of recent developments in this branch of biochemistry. Specialists, furthermore, will find ample documentation which will facilitate more detailed study of special subjects.

The author's principal interest is probably the chemical changes involved in fat metabolism. Thus the most valuable sections are chapters II and V. In the former, evidence is discussed which leads to the hypothesis that carbohydrate, which can undoubtedly give rise to fatty acids, is so converted *via* fructose diphosphate, pyruvic acid or acetaldehyde, an aldol condensation giving a long chain keto acid or aldehyde, followed by oxido-reduction giving the saturated fatty acid. In the latter chapter the possible processes of oxidative breakdown of fatty acids are discussed. The theory that desaturation in the liver is the first step in oxidation is discarded, since it has been proved that such unsaturated acids as might be formed cannot be synthesized by the body when their absence from the diet causes symptoms of ill-health; oxidation at the β carbon atom and breaking-off of two carbon atom fragments probably takes place and, recently, ω oxidation of the terminal (non-carboxylic) carbon atom of fatty acids has been proved. Multiple oxidation of alternate carbon atoms all along a chain does not find much support from experimental evidence.

Chapter IV describes the interesting story of the discovery that symptoms in rats caused by total deprivation of fat had their origin in a deficiency of acids more unsaturated than oleic acid, since the administration of this acid did not cure the condition but the two and three double bond containing acids, linoleic and linolenic, were strongly curative. The deficiency does not, however, cause any disturbance of the main course of fat metabolism, and so the more highly unsaturated acids must be essential in some other metabolic process.

Chapter VI is descriptive of the types of molecule of which fatty acids are components in the body. The reader may note here that there is an error in the description of the molecule of sphingomyelin.

Finally, chapter VII is concerned with the anatomical and chemical routes by which fat is transported across the intestinal mucosa, to the liver, and to and from the fat depots, and with the important part the phospholipin, lecithin, has been shown to take in fat transport.

Subjects referred to which may be of specifically veterinary interest are:—the fatty acids of milk fat; the fatty acids of plant oils in feeding stuffs; the effect of dietary fat and carbohydrate on the composition of body fat.—R. MCANALLY.

GELLHORN, E. [M.D., Ph.D., Professor of Physiology, College of Medicine, University of Illinois]. (1943). **Autonomic Regulations. Their Significance for Physiology, Psychology and Neuropsychiatry.** pp. xii +373. 80 figs. New York, N.Y.: Interscience Publishers, Inc. [8vo] [$5.50]. **503**

This book gives a comprehensive account of the role of the autonomic nervous system and its interrelations. Part 1 is introductory, dealing with the structure and functions of the system and the basic differences between the autonomic and somatic nervous systems. Part 2 deals with the various adjustments involving the respiratory and circulatory systems, including those to carbon dioxide, anoxia, asphyxia, haemorrhage, and hypoglycaemia. Part 3 is devoted to the nervous regulation of the pituitary hormones and the sympathetico-adrenal and vago-insulin systems. Part 4 deals with the integration of the autonomic and somatic nervous systems and part 5 includes a discussion of a great variety of subjects ranging from sleep, temperature regulation and starvation, to anaesthesia, artificially induced convulsions, and schizophrenia.

Such a wealth of information is contained within this work that it is not possible in a brief review to do more than indicate its contents. Each of the 19 chapters includes a useful summary and there are no fewer than 1,100 references, of which the author has contributed more than 50. There are 80 illustrations and also a useful frontispiece showing the afferent and efferent connexions of the hypothalamus. There are author and subject indexes, and the paper and binding are good. Two pages of the reviewer's copy were marred by the printing showing through to the reverse side of the paper, making the text rather difficult to read.

Apart from its value to physiologists as a monograph in which is collected a wealth of information relating to autonomic regulations, this work is of special interest to the psychologist and neuropsychiatrist.

—E. G. WHITE.

See also abstr. **346** (neural mechanisms in poliomyelitis), **474** (microbiology of meats).

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